

Ammonia Output Down for June as Compared to 1957

**Other Commodities Also
Reduced Production in
Same Thirty-Day Period**

WASHINGTON—Production of anhydrous ammonia dropped 11,849 tons in June, 1958, from the 348,158 tons recorded in May this year, according to preliminary figures just issued by the Bureau of the Census, U.S. Department of Commerce. June production of NH_3 was given as 336,309 tons.

The output of ammonium nitrate was also down in June as compared to that of the previous month. The figures were 154,204 tons for June and 186,376 tons for May. (The latter, a revised figure.)

Production of phosphoric acid dropped from 153,199 tons in May, to 139,295 tons in June, the report stated, and sulfuric acid went down from 1,309,774 tons in May to 1,216,192 tons in June.

Stocks at producing plants increased in June in all these commodities except ammonium nitrate. The following tons of materials were stocked at producing plants in May and June, respectively:

Anhydrous ammonia, 106,634 and 112,230 tons; ammonium nitrate, 182,215 and 174,796 tons; phosphoric acid, 14,255 and 15,182 tons; and sulfuric acid, 481,002 and 492,882 tons.

Infectious Particles of Bean Mosaic Move From Dead to Live Cells, USDA Discovers

Discovery by USDA scientists that southern bean-mosaic virus or its infectious particles move from dead to living plant cells, may give a new approach to chemical control of virus-caused diseases in farm crops, USDA announces.

I. R. Schneider, plant pathologist, and biological science aide J. F. Worley of Agricultural Research Service are working on the theory that the smaller particles, rather than the complete virus, move from dead water-conducting cells into living cells of the test plants.

Further research may confirm this theory and show that the moving particles are largely nucleic acid. Such acids in various forms and in combination with proteins comprise the basic makeup of viruses. Nucleic acids alone from other viruses have been known to cause virus infections.

Previous research by others has shown that the nucleic acid in tobacco-mosaic virus can be made ineffective by the enzyme known as ribonuclease. This substance, which

Northeastern Group Elects Thomas Cox Head of Committee

NEW YORK — Thomas R. Cox, chief agronomist, American Cyanamid Co., was elected chairman of the Northeastern Research and Education Committee at the group's meeting in New York Aug. 22. Members of the committee, in session with representatives of the National Plant Food Institute at the Governor Clinton Hotel here, stated that efforts should be concentrated on developing effective fertilizer demonstration techniques and on better methods to utilize and

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USDA Predicts 18 Million Cotton Acres in 1959 and 77.5 Million Acres Corn

By JOHN CIPPERLY
Croplife Washington Correspondent

WASHINGTON—Preliminary estimates at the workshop level of USDA indicate cotton acreage for 1959 under the recently enacted farm bill will be between 18-20 million with reliable judgment leaning to an 18 million plus acreage total. For corn, a more accurate estimate is available where USDA technicians now sense

a 1959 corn acreage of approximately 77.5 million for the entire nation.

In each instance, it presupposes a substantial increase in farm land for those crops, but in the case of corn it does not necessarily mean any overall increase in total feed grain acreage.

For the purposes of the fertilizer industry it is important to observe from the point of view of the USDA workshop where statistical material is developed for ultimate decisions at the front office.

The new farm bill authorizes the secretary of agriculture to permit excess of a basic 16.6 million acre base for cotton in 1959 by 40% for cotton farmers who will accept a level of price support at 65% of parity for that crop. Those who decline to take that level of support may remain within their proportionate share of the 16.6 million acre base and obtain not less than 80% of parity.

The farm bill as enacted by Congress (as yet unsigned by the President, but expected to be) leaves to the secretary of agriculture to determine how much cotton land may be increased in 1959—up to 40%. It has been concluded that he will authorize a full 40% increase in excess of the 16.6 million acreage base for cotton producers who will take the lower level of support mentioned above. However that decision has not been made.

Workshop officials at USDA are consequently in the dark as to the extent of cotton acreage in 1959 but they are willing to accept an estimate of between 18-20 million acres of cotton with the biggest increase occurring in the big cotton land of the Delta, the Southwest and West Coast cotton.

A factor heretofore not clearly seen, however, is that the farm bill pro-

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Fertilizer Use on Hay and Cropland Pastures Tallied

By J. R. Adams, L. B. Nelson and D. B. Ibach

Drs. Adams and Nelson are with the Soil and Water Conservation Research Division, and Mr. Ibach with the Farm Economics Research Division, Agricultural Research Service, U.S. Department of Agriculture, Beltsville, Md.

Part III Hay and Cropland Pasture

TEN percent, or 12.6 million acres, of the nation's hay and cropland pasture were fertilized during 1954 (2). The average rate of application per fertilized acre was 12 lb. N, 40 lb. available P_2O_5 , and 29 lb.

K_2O . This accounted for 4.2% of the N, 11.8% of the available P_2O_5 , and 10.5% of the K_2O applied as fertilizer in the United States (1). Comparable data are not available for past years.

Cropland pasture and harvested hay acreages, fertilized portion of harvested acreage, tonnages of applied fertilizer, and nutrient applications per fertilized acre during 1954, are given in Table 1 by individual states. The geographic pattern of percentage of harvested acreage fertilized, and pounds of N, available P_2O_5 , and K_2O applied per fertilized acre are depicted in Figures 1, 2, 3, and 4.

Highest percentages of the hay and cropland pasture acreages receiving fertilizer are in a belt of Seacoast States extending from Massachusetts through Mississippi and in a few widely-scattered irrigated areas in the West. The percentage of the acreage fertilized in most of the remainder of the country is uniformly low. In the North Central States, where hay is used in rotation agriculture, most of the benefit from fertilizers is a carryover from applications on other crops.

Thus utilization of residual nutrients from prior applications is responsible for the low percentage of the hay and cropland pasture acres fertilized. Also, manure supplies large quantities of nutrients to hay and cropland pasture areas of intensive livestock production.

The highest percentage of pasture acreage fertilized is 81% in the irrigated Imperial Valley of California. States with the highest percentages fertilized in unirrigated humid areas are Rhode Island with 71%, followed in turn by Maryland with 42%, Geor-

(Turn to FERTILIZER USE, page 20)

can be obtained from any living organism, will not, however, destroy the tobacco mosaic virus in complete form (that is, protein plus the nucleic acid).

For this reason, the scientists believe that these smaller infectious particles of the southern bean-mosaic virus may be more easily controlled than the complete virus. Such control would involve the use of chemicals as seed or soil treatments, leaf sprays, or similar means. The purpose of these treatments, the scientists explained, would be to inhibit movement of the infectious particles and prevent an increase of the virus in a new location within a plant.

At present, there is no known practical way to control plant virus diseases with chemicals, including antibiotics. Prevention of virus movement throughout a plant's system, however, would greatly reduce disease severity, the scientists said.

Control of virus-caused diseases in plants is now largely a matter of preventing spread of these infections from plant to plant by crop-

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Dr. Laurence C. Walker

NPFI Appoints Expert to Head Forest Fertilization Study for Industry

ATLANTA, GA.—Dr. Laurence C. Walker has accepted a temporary appointment as chief forester for the National Plant Food Institute, Dr. Samuel L. Tisdale, Southeastern Regional Director, has announced. The appointment became effective July 1. Dr. Walker will be on leave from the University of Georgia for this special assignment.

His primary responsibility will be to summarize and evaluate forest fertilization work currently under way in the Southeastern states and to explore the need for a coordinated program of research activities in this field. He will be assisted in his work by a six-man college-industry task force to be appointed in the near future.

Dr. Walker, a native of Washington, D.C., is currently associate professor of forestry with the University. He obtained his B.S. degree in forestry from Pennsylvania State University, his M.F. from Yale University, and Ph.D. degree in forest soil chemistry from the New York State College of Forestry at Syracuse University.

His work will determine the nature and extent of forest fertilization studies now under way, determining those areas in which duplication exists. He will then devise a plan of research under which the efforts of the land-grant colleges, the pulp and paper interests, and the fertilizer groups could be coordinated for maximum effectiveness.

Elbert N. Carvel Gets Nomination for Senate

LAUREL, DEL.—Elbert N. Carvel, president of Valliant Fertilizer Co. and a member of the board of directors of the National Plant Food Institute, has been nominated on the Democratic ticket, for the United States Senate. Mr. Carvel, formerly governor of the state and long active in its politics, will oppose the Republican incumbent, Sen. John J. Williams, in the general election in November.

Two Escape from Crashes

MEMPHIS—Two aerial applicators escaped death in two separate Mississippi plane crashes.

Roger Descomb, 22, sustained a broken neck when his plane crashed near Morgan City. The crash came at the end of Descomb's first day of crop dusting. Descomb said his wing brushed a tree and threw him into a power line.

Jack Foldager received head and back injuries when his plane stalled out in a turn and crashed near Leland.

Agenda Announced For Conference on Chemical Controls

WASHINGTON—The agenda has been announced for the conference on chemical control problems scheduled to be held here Oct. 16, 1958, under the sponsorship of the National Plant Food Institute. The meeting, held at the Shoreham Hotel, Washington, will be called to order at 9:30 that morning by Dr. Vincent Sauchelli, chemical technologist of the Institute and chairman of the meeting.

Talks scheduled for presentation in the morning session include: "Use of Statistical Methods in Analytical Chemistry," by John Mandel, U.S. Bureau of Standards, Washington; "Proposed Reorganization of Magruder Sample Work—Design of Experiment," by E. Glocker, Davison Chemical Co., Division of W. R. Grace & Co., research laboratory; and "The Importance of an Accurate Determination of Moisture in Fertilizers," by C. H. Perrin, research chemist, Canada Packers, Ltd., Toronto, Canada. Appearing as final speaker on the morning program will be Dr. W. L. Hill, U.S. Department of Agriculture, Beltsville, Md.

Following lunch, the following subjects and speakers are scheduled: "Report on Collaborative Study of Spectrophotometric Method of Analysis of Triple Superphosphate," by W. M. Hoffman, USDA, Beltsville, Md.; "Relation of the State Regulatory Office and the Local Fertilizer Industry," by Bruce Poundstone, Kentucky State chemist; "Are We Willing to Pay the Piper?" by John A. Brabson, TVA research branch, director chemical development; "Intermittent or Continuous Shaking in the Procedure for the Determination of Insoluble P_2O_5 ," by H. L. Marshall, Olin Mathieson Chemical Corp., discussion leader.

Dr. Sauchelli will present a resume of results of the NPFI chemical control project, and an open discussion will follow. Among the topics listed in the agenda for discussion are the following:

1. Importance of accurate determination of free acid in superphosphate vis-a-vis ammoniation.
2. Desirability of dependable quick method for direct determination of available P_2O_5 .
3. Use of a coding system in the production of bagging and shipment of fertilizers.
4. Procedure in sampling in AOAC Sec. 2.1.
5. Sampling for production control.
6. Solutions analysis particularly for total nitrogen.
7. Fertilizer analysis for ammoniacal nitrogen.
8. The value of determining urea in mixed fertilizers.

Named to Head Methods Improvement Section For Aircraft Spraying

BELTSVILLE, MD.—Kenneth Messenger, formerly in charge of the Aircraft and Special Equipment Center, was recently appointed head of the Methods Improvement Section with headquarters at the Plant Industry Station, Beltsville, Md. He replaces W. G. Bruce who transferred to the Animal Disease Eradication Division.

In this capacity Mr. Messenger represents the division director in developing practical solutions to Federal-State cooperative pest control problems. He acts in a liaison capacity between the Plant Pest Control Division and the Federal, State, and industry agencies engaged in research. In close cooperation with these groups, he furnishes technical assistance and guidance and coordinates methods improvement programs in the several regions.

The functions of the Aircraft and

Special Equipment Center (which will not be continued by their former names) are included in the functions of the Methods Improvement Section. They are directly supervised by Donald Whittam and Arthur Gieser, assistant section heads.

Mr. Whittam is responsible for methods improvement work on equipment, including aircraft, and Mr. Gieser for the technical direction of aircraft operations. Both have been with the aircraft and special equipment center since its establishment at Oklahoma City in 1951. Formerly, they were with the Gypsy Moth Control project and the Grasshopper Control project, respectively, in charge of aircraft application work.

Samuel O. Hill, assistant section head, is responsible for methods improvement work on quarantine certification treatments and the various technical problems related to pesticides on a field scale. He works closely with research agencies in the development of improved pesticides, coordinates the results of laboratory research for use in large scale field operations, and recommends additional research when indicated.

Thiram in Liquid Suspension Offered

WILMINGTON, DEL.—The first commercial liquid suspension of thiram, for slurry treatment of seed and for use as a paint or spray repellent against rodents, rabbits, deer and birds, has been developed by the Du Pont Co. It is called "Arasan" 42-S seed disinfectant and protectant. "The new product marks a major accomplishment in the more than three decades of Du Pont research and development with chemicals for treatment of seed. This is the first product to offer the safety and fungicidal efficiency of thiram with the convenience and other advantages of a liquid formulation," a Du Pont spokesman said.

The product is described as a stable suspension of extremely fine particles of thiram, containing four pounds of active material per gallon of product. It can be used wherever slurry treatment of seed with "Arasan" is recommended. The liquid formulation is easy to measure, and disperses almost instantaneously when it is added to water, the makers say. The fine particles of chemical are said to adhere tightly and uniformly to the seed without dusting off, giving thorough, even coverage for maximum fungicidal protection and uniform flow of the treated seed through planting equipment.

For slurry treatment it is used at rates ranging from two and three-quarters pints to 11 pints to the gallon of water.

The use of thiram for treatment of nursery stock, fruit trees and forest seedlings to repel rodents, rabbits, deer and birds has developed during the last several years. The new product has sticking qualities to eliminate the need for a sticking agent, the makers claim.

"Arasan" 42-S will be sold through distributors handling Du Pont seed disinfectants, and will be packed in one- and five-gallon drums, Du Pont says.

New Mexico Firm Appoints Officer

CLOVIS, N.M.—Sunshine Plant Food Co. of Clovis, N.M., has announced the appointment of B. E. Adams as executive vice president and general manager, with executive offices in the Exchange Bank Bldg., Dallas, Texas.

Sunshine has also appointed two new manufacturers' representatives, to sell its line of steer and sheep manure. Horticultural Marketers, Inc. of Ft. Lauderdale, Fla., will service Florida, Alabama, Georgia and part of South Carolina. The Estes Co., Dallas, will represent Sunshine in Texas, Oklahoma, Louisiana, Arkansas and Memphis, Tenn.



E. F. Bashor

Shell Chemical Announces New District Manager

NEW YORK—Shell Chemical Corp. has announced the appointment of E. F. Bashor, sales supervisor of its San Francisco agricultural chemicals district, as district manager, succeeding L. F. Stayner, who is retiring.

Mr. Bashor came to Shell in 1938, when the company purchased the insecticide business of Balfour, Guthrie & Co., for whom Mr. Bashor was then working.

He is a native of Los Angeles and attended Oregon State College. Coming to San Francisco in 1949 as assistant manager of Shell's insecticide group, he was named sales supervisor later that year.

As district sales manager, Mr. Bashor is responsible for the marketing and servicing of Shell's line of agricultural chemicals in the 11 western states and the supervision of five sales offices.

Mr. Stayner, a native of Redding, Cal., joined Shell as a salesman in 1938 when that company purchased the insecticide business of Balfour, Guthrie & Co. Following a series of promotions, he moved to New York in 1949, returning to San Francisco in 1954 as manager of the Pacific Coast district.

During his career, he has maintained an active interest in the fields of entomology and agricultural chemicals. He helped found and is past president of the Western Agricultural Chemical Assn.

South Dakota Agronomy Field Day Scheduled

BROOKINGS, S.D.—Two field days have been scheduled during September at South Dakota State College. Agronomy Field Day will be held on Wednesday, Sept. 10 and Swine Field Day will be held on Thursday, Sept. 11.

According to Lyle Derscheid, associate professor in agronomy, the agronomy field day will cover experimental work now in progress with corn, sorghum and soybeans. It will include results of testing commercial hybrids, fertility experiments in corn, pre-emergence weed control, moisture utilization and corn diseases. Hybrid sorghums and soybean varieties will also be covered.

R. C. Wahlstrom, associate professor in animal husbandry, said the swine field day will feature a panel of veterinarians who will discuss swine diseases.

NEW MANAGER

OKLAHOMA CITY, OKLA.—Earl E. Nichols has taken over the general manager duties of the Nichols Fertilizer Co., Wheatland, Okla., in addition to serving as president and board chairman. Mr. Nichols also serves as head of the Nichols Seed Co., Oklahoma City.

Change Pattern Characterizes Fertilizer Industry Structure

Changes in Technology, Marketing, Application and Improved Attitudes of Farmers Toward Use of Plant Nutrients Result in Perpetual Expansion of Trade

By E. L. Baum and S. L. Clement*
Tennessee Valley Authority
Wilson Dam, Alabama

CONSUMPTION of fertilizer nutrients in the United States since World War II has doubled, from 3 million to 6 million tons of plant nutrients.¹ This is a spectacular growth, but even more spectacular has been the growth of fertilizer use in certain areas of the country. In the West North Central States, plant nutrient consumption during this decade has increased four times; in the East North Central States, it increased one and one-half times; and even in the South Atlantic States where commercial fertilizer has been used for over a century, plant nutrient use increased about thirty-five percent (see Table 1). This sudden expansion of the industry has been accompanied by marked changes in the marketing structure, not only as to form, participants, practices, and goods handled, but also as to the market and plant location, fertilizers demanded, and fertilizer uses.

Of particular interest are the reasons for this phenomenal expansion and growth. What factors have brought about these changes and what are their significance for the future? Are there new forces in operation, or on the horizon having portent for growth in the industry and changes in the marketing structure for fertilizer? Reference to some of the historical developments in the industry will provide perspective.

The embryonic stages of development in the commercial fertilizer industry of the United States started about a century ago. Justus von Liebig's research work in plant-soil relationships in Germany and that of other pioneers like Lawes and Gilbert in England did much to advance fertilizer technology.² Of

course, prior to that time and over the centuries, farmers throughout the world had recognized the value of applying crop residues and manures on their land. So a market of sorts was ready made in some of the older agricultural areas of this country when the fertilizer industry first began to develop. Initially, imports of guano were used to supply industry's needs to fulfill farmers' demands for fertilizer. Sodium nitrate from Chile was also imported at an early date. Byproducts from slaughtering plants, coke-oven operations, and other industries plus imports provided the principal sources of fertilizer in the United States for many years.

Fundamental to the organization of any industry are those agencies which handle the products of the industry. In the fertilizer industry, these agencies are (1) importers and exporters, (2) primary producers, (3) brokers and wholesale distributors, (4) mixers, (5) retail dealers, and (6) ultimate users. Marketing functions performed by each of these agencies (except, of course, ultimate users) to a greater or lesser degree are as follows: Importers and exporters—jobbing; primary producers—production and/or wholesaling; brokers and wholesale distributors—wholesaling; mixers—wholesaling and retailing; retailers—retailing.

Changes in the marketing structure for fertilizer have been and are being "triggered" by technological, economic and sociological, institutional, government policy, and other dynamic factors. The authors wish to present and analyze the nature of the fertilizer marketing structure as it exists today, the forces that have contributed to the present structures, and some changes that may occur in its future in the U.S.

Commercial fertilizer entering the channels of commerce consists of a very large number of specific products each containing to some degree, nitrogen, phosphorus, and/or potassium.³ Some of these products—particularly the straight materials

—are more or less suitable for further processing into other fertilizer products, or in their present form may be used for direct application to the soil. Additional nutrients (minor elements) essential to plant growth and in short supply in some soils frequently are added to mixed fertilizers.

Fertilizers were initially distributed in a solid pulverized form, but now are available as gases, liquids, and solids. The largest amount is still distributed in the solid pulverized form, although there has been a marked increase in the manufacture and use of pelletized dry fertilizers to replace the pulverized form. Large increases are developing in the use of gaseous and liquid forms (especially nitrogen) in many of the principal agricultural areas.⁴

Market Structures

The structure of markets frequently resembles the shape of an hourglass, that is, from a widely scattered production area the product, through a series of steps, is concentrated and processed, and then, through another series of stages, the product in its final or near final form is distributed to widely scattered consumption areas.

The general structures of the fertilizer industry and of its markets represent typical nonagricultural industry configurations. This is a pyramid structure with a few producers at the top developing from concentrated sources of raw materials the primary semi-finished products of the industry. A fanning-out to a larger and larger area occurs as these primary products move through the marketing channels, and from points of further refinement or production.

3. Fertilizers are designated by grade as to their content of nitrogen, phosphorus pentoxide (P_2O_5), and/or potassium oxide (K_2O). Thus, a 5-20-20 mixed fertilizer contains 5% nitrogen, 20% P_2O_5 or its equivalent in terms of phosphorus, and 20% K_2O or its equivalent in terms of potassium. Carriers of single nutrients are designated as straight materials, such as 33.5-0-0 for ammonium nitrate.

4. Fertilizers Applied in Liquid Forms—ARS Special Report 22-35, USDA, November, 1956.

The Nitrogen Industry

The nitrogen fertilizer industry of today is composed of four principal segments in providing material for the fertilizer industry. In their relative order of importance these are: (1) synthetic, (2) coke-oven byproducts, (3) imported nitrogen salts, and (4) organic byproducts. At present, it is estimated that the first three sources supply about 97% of all fertilizer nitrogen used, and that about 90% of all fertilizer nitrogen moving through the marketing channels and being used has its source in a synthetic process.⁵

Some of the products which are representative of the various sources from which they come are as follows: (1) synthetics are such fertilizers as anhydrous ammonia, nitrogen solutions, aqueous ammonia, ammonium nitrate, urea, ammonium phosphates, and ammonium nitrate-lime; (2) coke-oven byproducts are primarily ammonium sulfate; (3) imported nitrogen salts are primarily sodium nitrate and potassium nitrate; and (4) organic byproducts are such materials as dried blood, fish scrap, and tankage.

Prior to World War II, domestic production and imported materials each furnished about 50% of the nitrogen used in commercial fertilizer. The principal domestic production was ammonium sulfate, byproduct of coke-oven operations.

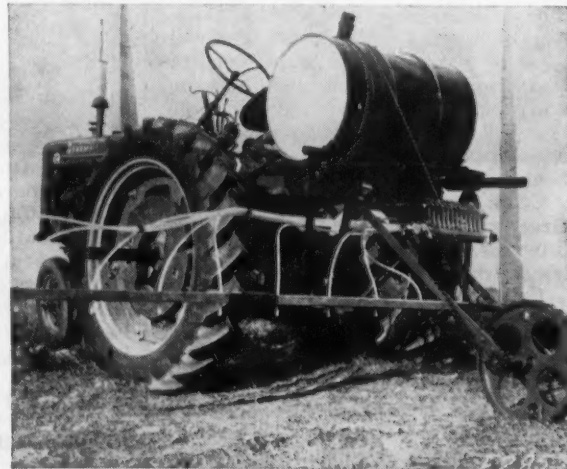
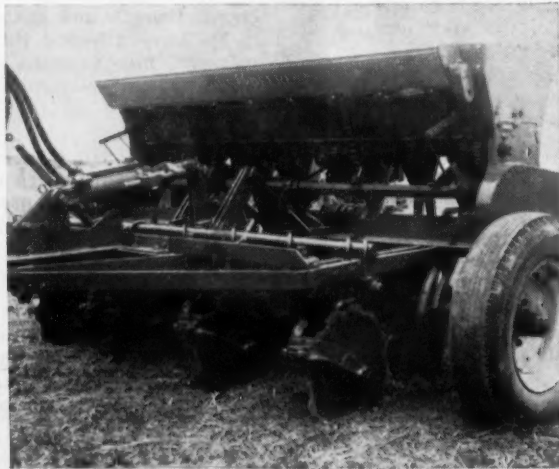
The imported material was principally sodium nitrate from Chile.

Coke-oven byproduct production of ammonium sulfate was manufactured in about 80 plants having a rated capacity of 200,000 tons nitrogen. However, these were used at only about 50% of capacity. These byproduct operations have not changed materially as to number of plants, capacity, or actual production since the mid-twenties.

In the immediate pre-World War II era, total imports of nitrogen to the U.S. reached approximately 220,000 tons, of which all except perhaps 5-7,000 tons were used annually for fertilizer. The production of synthetic nitrogen which was to develop into the major source for fertilizer nitrogen, was concentrated in the hands of only three producers prior to World War II. At this early date, these plants were producing cyanamide, urea, ammonia liquor, and various other solutions of nitrogen salts. Most of their production for use in fertilizer had been employed in the ammoniation of superphosphate to add a few units of nitrogen to mixed fertilizers and to give an improved mechanical condition.

The principal initial stimulus to (Turn to CHANGE PATTERN, page 17)

5. Mehring, A. L., et al—Statistics on Fertilizer and Liming Materials in the U.S.—Statistical Bulletin No. 191, USDA, April, 1957, Tables 1, 4 and 5.



FERTILIZER APPLICATION—Along with development of manufacturing and marketing techniques in the fertilizer trade as described fully by the authors of the above article, the science of applying fertilizer effectively has also come a long way. At the left is a commercial beet and bean drill and cultivator used as a drill placing fertilizer in the furrow with the seed some quarter-century ago. This method of placement with today's high rates of fertilization recommended for vegetable crops could result in burning of the young plants. In the center is a grassland drill which deposits fertilizer

at the bottom of the opening made by the applicator, covered by a layer of soil, and the seed is deposited at the rear of the applicator and covered by another layer of soil. The press wheels follow to firm the soil. At the right is a device for the dribble broadcast application of fertilizer solutions on the soil before planting on drilled crops such as grains or on pasture or hayland. A metering hose pump, driven by a ground wheel by a chain activates the flow of material through a dozen discharge hoses attached to a hinged wooden boom. (Photos courtesy W. C. Hurlburt, USDA, Beltsville, Md.)

INSECT AND PLANT DISEASE NOTES

Texas Farmers Urged to Control Cotton Insects

TAHOKA, TEXAS—After a summer of light insect infestations, cotton farmers are finding increasing numbers of boll worms and cabbage loopers. Thrips have also made a comeback after almost disappearing in many fields.

Local farmers are being urged to check fields closely for signs of cabbage loopers. The only effective time to control them is while they are very small.

Most county agents and entomologists report farmers have done an excellent job of insect control this year. "It's getting better each year," said one, "but we still have difficulty in convincing them that the tiny insects need controlling. Right now some of the cotton that is shedding may not be because of dry weather as farmers say. The thrips are likely causing some of it."

Corn and Vegetable Pests in New Jersey

NEW BRUNSWICK, N.J.—Oriental fruit moth twig activity is reported and observed to be much later in occurrence this summer, due to succulent twig growth. This may be a factor on very late varieties causing late injury. Particularly if late blocks are adjacent to unsprayed young blocks, an extra parathion spray at least 14 days from harvest may be worthwhile.

Corn borer, earworm and fall armyworm activity is increasingly heavy. Earworm moths are several times as numerous as last week in trap collections. Fall armyworm moths are very numerous now. (Aug. 19)

Cabbage looper is serious on broccoli and cabbage. These insects are also active on tomatoes with some foliar injury. No fruit injury, so spraying is not recommended.

Green clover worms are quite abundant on snap and lima beans. Parathion is effective for control.

More downy mildew on melons reported from Delaware and Maryland. None observed yet in New Jersey, but suggest strict adherence to spray program.—Spencer H. Davis, Jr.; Leland G. Merrill, Jr., and William E. Collins.



Cotton Insects Active at Arizona Harvest Time

PHOENIX, ARIZ.—Cotton picking is under way in most areas, but insects continue to cause damage in many fields. Generally speaking, cotton bollworms, salt marsh caterpillars, beet armyworms, leaf perforators, loopers and stink bugs are causing the greatest damage. In some fields, Lygus continue to be a problem, especially where squaring is heavy.

Stink bug counts are very high in Graham County and dusting is in progress. There continue to be a few bollworms and some Lygus.

In Maricopa County cotton is fruiting heavily in the top, and Lygus, stink bugs, salt marsh caterpillars, perforators and loopers are all causing damage in some fields. Insect counts are as follows: Chandler-Gilbert-Queen Creek—Lygus high in many fields, up to 31 per 100 sweeps. Some stink bugs. Salt marsh caterpillars hatching. Lots of small loopers and looper eggs. Bollworms, armyworms and perforators high. Some mites.

Buckeye-Palo Verde-Litchfield-Beardsley-Tolleson-Laveen-Glendale-Peoria-Deer Valley—High Lygus counts in some fields. Stink bug

counts as high as 12 per 100 sweeps. A new hatch of loopers and salt marsh caterpillars also showing up. Perforator counts very high. Cotton bollworms either present or on the increase. Scottsdale-Mesa-Tempe—Lygus down and stink bugs up. High perforators, salt marsh caterpillars and loopers. Bollworms building up.

In Yuma County, cotton is maturing nicely. (Aug. 23) Picking is under way in both stub and planted. The insect counts are as follows: Yuma Valley-Somerton-Gadsden—10 to 50% of the squares injured by Lygus and other sucking insects. Salt marsh caterpillars on the increase. Cotton leaf perforators on the decrease. In Roll-Wellton, insect counts rather low. One field showed young hatch of salt marsh caterpillars. One field showed 80% of the squares injured by Lygus. Yuma-Mesa—Lygus counts 5 to 100 per 100 sweeps. Square damage 5 to 15%. Cotton leaf perforators causing damage, along with loopers and salt marsh caterpillars.

Lygus present in most Pinal County fields where controls not present. Salt marsh caterpillars being controlled by recommended materials in most cases. Bollworms on increase, along with leaf perforators.—J. N. Roney.

Michigan Farmers Warned To Combat Hessian Fly

EAST LANSING, MICH.—The Hessian fly problem is still a real one, and Michigan State University specialists are warning wheat farmers to wait for the "fly-free" date before planting, when there is little likelihood of damage from the fall brood of the Hessian fly. The fly feeds at the base of the plant and, depending on how heavy the infestation is, damage may be slight or plants killed.

For central Michigan, the fly-free date is Sept. 18. It ranges from early September in the northern part of the Lower Peninsula to about the last of September in both the southeastern and southwestern corners of the state.

Michigan State University entomologists are working with several new systemic insecticides which will protect wheat plants from larvae of the fly.

Grasshoppers Damage New Mexico Crops

STATE COLLEGE, N.M.—Grasshoppers are still a problem in alfalfa fields and gardens throughout many areas of the state.

Heavy infestations of McDaniel mite (*Tetranychus mcdanieli*) on apple trees in Hondo and Espanola valleys are severely damaging foliage. Third generation codling moth larvae are now hatching and feeding on apples in Hondo Valley.

Grasshoppers are also in light to moderate infestations damaging seedling lettuce near Artesia, Eddy County.

The cotton aphid (*Aphis gossypii*) is in generally light infestations in most cotton growing areas with some spotty and heavy infestations.

Bollworm eggs were present in all fields checked in Sierra County (Aug. 18) and two cotton leafworm (*Alabama argillacea*) larvae were found in cotton fields in Sierra County.

Delaware Reports Both Insects and Plant Diseases

NEWARK, DEL.—Here is a run-down on the disease and insect situation on apples. Sooty blotch and Botryosphaeria rot increasing on unsprayed Romes, and some blocks showing more terminal scab. Slight cracking of Stayman found. Fresh codling moth stings observed in both Kent and Sussex counties, Aug. 19.

Red-banded leaf roller pupae and one adult collected in Kent County, Aug. 18. Emergence of adults from collected pupae began Aug. 19.

On peaches—brown rot increasing but control still good.

On lima beans, some increase in downy mildew is expected in the next few days in New Castle and the upper part of Kent County; little increase expected in Sussex County. Various sizes of green cloverworm larvae present in destructive numbers in most bean growing areas in the state. Potato leafhopper very common near Nassau and quite prevalent at Middletown.

Several plant bugs, including the tarnished plant bug and rapid plant bug, fairly numerous on potatoes in the Bethel area.—Donald MacCreary and J. W. Heuberger.



Fall Armyworm Present in Missouri Sorghum

COLUMBIA, MO.—Fall armyworms, and some corn earworms, are injuring the heads of grain sorghum in some areas. So far, most of the injury has been in the southern sections of the state. The worms are feeding inside the heads, and when numerous, will cause heavy grain losses.

Hessian fly injury this spring was considerably heavier than we have seen for several years. We expected to find a heavy carryover in stubble this summer, but our survey counts, for some unexplainable reason, are much lighter than we anticipated. At this point, we frankly don't know what this means. Although the survey counts would indicate a light infestation this fall, we still feel there is a good chance of a fairly serious fly problem over much of the state.—Stirling Kyd and Geo. W. Thomas.

Grasshoppers Doing Damage in Wisconsin

MADISON, WIS.—Corn earworm adult moth flight is now taking place, (Aug. 22) and the flight of the second brood of the European corn borer is continuing according to blacklight trap catches. Treatments for protection of sweet corn against these insects simultaneously should be under way.

Heavy populations of adult red-legged grasshoppers were found damaging red clover in some spots in eastern Portage County, where numbers were estimated at 75 or more per square yard in some fields. Third and fourth instar nymphs, and a few two-striped grasshoppers were also present.

Observations in forage in light soil areas of Green Lake and Marquette counties revealed counts of 10 to 45 grasshoppers per square yard. Drought and other forage insects have affected the forage adversely, but grasshoppers can be blamed for considerable leaf reduction. In some of the heavier soil counties, counts seldom exceeded 10 per square yard although 20 to 30 per square yard were recorded for a Calumet County field. The red-legged grasshopper is the dominant species.

Damage is heavy in some Wood County fields and treating for control is taking place. Winnebago, Waukesha and Shawano counties also report large numbers of grasshoppers in some fields. In general, present grasshopper populations vary considerably between fields.

Adult meadow spittlebugs are more numerous than at least any time since 1944 and, in addition, currently infest a greater area of the state than in 1944.

Alfalfa plant bug populations are very high as are tarnished plant bugs in many alfalfa fields.

Potato leafhopper populations con-

tinue to be variable between and within alfalfa fields and, in general, are less numerous than last year.

European corn borer moths have been laying eggs. Hatched egg masses in Rock County and "black-head" egg masses in Columbia County were observed on Aug. 18. Considerable variation in pupation exists between different areas of the state.

In the western counties, 25% of the corn borers were killed by parasites.

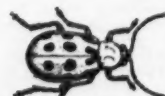
During the period from July 25 to Aug. 2, a strong flight activity of the corn leaf aphid was noted, but did not approach the magnitude of the same period last year. The same seems to be true for the colony size of the aphid in the corn fields. Although a high percentage of corn is infested, the total number of aphids seems to be lower than in 1957. A reduction of corn leaf aphids because of parasites seems to have occurred this past week, but their injury to corn is more evident.

The competition of the corn plant and the aphids for moisture during this period of drought makes it possible for fewer aphids to damage corn than last year when moisture was more plentiful. Other cereal aphids were not trapped and appear only in small numbers occasionally on grasses. Other prevalent aphids during the period were *Myzus persicae*, *Aphis fabae*, and certain tree aphids. Trapping results at this time of the year vary greatly with the location.

About 5% of the tobacco plants in a Vernon County field were infested with hornworms on Aug. 15.

Potato aphids are building populations in Racine and Kenosha counties, but are not present in the Rhinelander area where normally expected. At Rhinelander both nymphs and adult potato leafhoppers were abundant, but potato flea beetles have low populations.

The six-spotted leafhopper, while slightly less numerous than last year in the Rhinelander area, has populations about ten times that in the Kenosha County area. This is due to the late seasonal appearance of the six-spotted leafhoppers in southeastern Wisconsin. This insect, which transmits the "aster-yellows" virus, has infected about 80% of untreated celery in the Madison area and, although populations are light in the Kenosha-Racine area, it is infective and the aster-yellows disease is showing up in some of the area's carrot fields.



Insects Wait for Chance To Eat Canadian Grain

OTTAWA, ONT., CANADA—With whetted appetites, insects and mites are impatiently awaiting grain from the 1958 harvest, according to the Canadian Department of Agriculture.

Thousands of these pests are lurking in empty farm granaries, hungrily contemplating the day when they will be able to munch on fresh supplies of grain.

Surveys carried out by stored product entomologists from Winnipeg show granaries in the prairie provinces are infested with mites and insects, according to F. L. Watters, Science Service, Canada Department of Agriculture.

They have been found in floor and wall cracks, in loose grain on the floor and plates, and in crusted grain on wall studs.

Mr. Watters warned that unless granaries are thoroughly cleaned, repaired, and sprayed with insecticide before being filled with grain, insects may cause serious losses.

The insecticide chosen should be applied at the rate of one gallon per 1,000 square feet of floor and wall surface. Usually, one gallon will do a 1,000-bushel granary, he said.



WORLD REPORT

By **GEORGE E. SWARBRECK**
Cropplife Canadian and Overseas Editor

Amidst the mutterings and murmurings of the politicians, the threats and counter threats of governments and the recurring rumors of wars and skirmishes, life in the troubled Middle East goes on its age-old way. Yet, there is a new alertness, a new awareness of industrial potentiality in the air. Basic to this change is agriculture and the need to improve crop production is the spur upon which an industrial foundation is being built.

Typical examples of this resurgence are two of the chief protagonists in the battle of the Middle East—Egypt and Jordan. And the fertilizer industry is the mainspring of activity in both cases.

Egypt's participation in the chemical industry, hitherto, has been small. The demand for chemical products is minor but President Nasser is determined to have a chemical industry of sorts. And a start has been made with fertilizers because those products can be absorbed by agriculture and they are badly needed.

Sulfuric acid production has been stepped up as the first move in developing a basic chemical industry.

The Egyptians hope to become self-sufficient in nitrogenous fertilizers, reports state. One company, Societe Egyptienne des Produits Chimiques, S.A.E. is building a plant which will produce 370,000 tons of ammonium nitrate every year. Two plants are involved in the manufacture of superphosphate and another firm, Societe Egyptienne d'Engrais et d'Industries Chimiques S.A.E., is producing calcium nitrate at Suez. All these plants are expected to grow within the next few years.

Rapidly developing in Egypt is the market for pest control products. Like many Middle Eastern countries, Egypt suffers greatly from insect infestations and the damage to crops is no light matter. The technical assistance program of the United Nations has erected a DDT plant and more developments in this line are expected.

Jordan's Export Phosphate Trade

Industry in Jordan is limited, being mainly based in the processing of olive oil, soap and tobacco. Nothing much has been done in the way of building a chemical industry, but the main source of foreign exchange earnings is phosphate.

Phosphates are the chief group of minerals found in Jordan. Deposits are stated to total some 30 million tons. Between 1954 and 1956 production increased from 80,000 tons to 208,000 annually. The main firm involved is the Jordan Phosphate Co. and officials say they hope to boost output to a million tons a year by 1960. The company plans to build a superphosphate plant. Capacity will be 150,000 tons a year and it will be capable of meeting the requirements not only of Jordan but of Syria, too. That is, if the two countries remain on trading terms. The countries of the Arab world are attempting to achieve economic inter-dependence and each day sees Jordan being drawn closer and closer to the Nasserite web.

Potash is found in the Dead Sea area and was extensively mined prior to 1948. Then the Palestine war halted production both for Jordan and for Israel. The Israeli people went back into production in 1952 at the south end of the sea

and now they have a thriving business.

A company has been formed in Jordan to exploit the deposits—it hopes to recover bromine and magnesium as well as potash—with capital provided by the government and by Saudi Arabia, Iraq, Egypt, Lebanon and Syria.

On the industrialization front, the government of Iran is proceeding with plans to build two chemical plants. One factory will produce sulfuric acid, the other superphosphate. Iraq

is getting into the industrialization act, too, in a fertilizer-way. A plant is to be built at Bazra with an initial capacity of 250,000 tons of sulfate of ammonia a year. Later, it is expected that the plant will be enlarged to permit the production of other types of fertilizers.

No matter where one looks in the Middle East—among the Arab and the non-Arab nations—there is a common pattern of cooperation, and the chemical industry, founded initially on oil, is a common root.

Peruvian Factory

Startling developments in fertilizer production are taking place in South America where availability of supplies is nowhere near sufficient to meet the demand.

Examined in this connection is Peru. That country expects to have its first fertilizer factory in production by the end of this year. Location is at Callao. Peruvian financiers are finding 80% of the capital and the an-

nual output will be in the region of 50,000 tons.

Fisons Proprietary has announced the completion of arrangements with the Industrial Development Corp., the Commonwealth Development Finance Co., and the Industrial Finance Corp. of South Africa for the partial financing of its new factory at Sasolburg, S.A.

Expected to go into production next year, the new plant will produce sulfuric acid, superphosphate and compound fertilizers.

Principal stockholders in the South African firm of Fisons are Fisons of England and Albatros Superfosfaat of Holland. The company already operates factories at Durban and in the Cape Town area.

Other Building Projects

Where else in the world are plans being made for the construction of new facilities? Greece, Peru and

(Turn to **WORLD REPORT**, page 8)



For fertilizer manufacturers... USP OFFERS 3 OUTSTANDING GRADES OF POTASH

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HOW FREE DO WE REALLY WANT TO BE? . . .

Businessmen Still Want to Risk Capital to Guide Own Destinies

By Ron Kennedy*

Vice President, F. H. Peavey & Co.
Minneapolis, Minn.

How free do we really want to be? — among friends in the Shippers Advisory Board where we have shared so many transportation problems through the years, I choose to make an optimistic answer to the question of our freedom and our future.

"How free do we really want to be?" Well, in our more discouraging moments we sometimes let ourselves get the feeling that Americans have lost the dream, that liberty has yielded to something mis-labeled "security."

There is plenty of evidence all around us, though, that this has not really happened. A few extremely vocal individuals are among us, particularly here in our part of the country, who are trying their best to talk us into it, and perhaps we tend to take them all too seriously.

One does not have to be at all Pollyannish to find many examples of the continued willingness of Americans to take risks, and to sacrifice and deprive themselves when necessary, for the sake of retaining control over their own affairs rather than abdicating to the Great White Father in state or national capital.

Sure, we have a concern. Sure, there is a challenge—a very real and determined challenge—to our way of life. Sure, the question of what is sinking into the minds and hearts of young people with regard to economics and politics is one that is not yet answered.

But all is not lost—not by a jugful—and I'd like to cite a few examples.

We here are joined by a common interest in transportation, and it would be hard to find an area in our economy more beset with difficulties. But lest we become too much bemused with the dust of the road at our feet, let us not forget the star-dust that is in our eyes.

The tragic loss recently of the jet pilot Ivan Kincheloe reminds us of how far we have come, and how very much farther we are going. That young man rode the first tough road 24 miles away from the surface of our planet Sol III, and his dream, before it was snatched away from him, was to be the first to blast off to still greater distances; into orbit, perhaps beyond.

But another has already taken his place, and the new horizons in transport will continue to be pushed away and away, relentlessly.

I go quickly back in my thoughts to some of the beginnings of the transportation revolution that led to these flights of today and tomorrow. I choose a moment a half century ago—July 31, 1908.

On that day the Frenchman Henry Farman flew his biplane over New York City, the first heavier-than-air machine ever to make such a flight—a dramatic door-opener to the five breathless decades we have just lived through.

Henry Farman just missed by a couple of weeks living out the full 50 years following his memorable achievement. He died in July, but the revolution in transport he helped to touch off rolls on without him.

The same paper that carried Farman's obituary also told of the U.S. Air Force announcement of the F-108 fighter interceptor that will

have speeds above 2,000 miles an hour and will carry at least two guided missiles with atomic warheads; and the B-70 chemical bomber that will use the same engines as the F-108 but will employ afterburners using the new so-called "exotic" chemical fuels to give it bursts of speed equivalent to that of the fighter.

The next year after Henry Farman's New York flight, another kind of revolutionary transport hit the roads of the nation. The first Model T's put on the market by Henry Ford sold for \$950.

In 1909 this was much lower than the cost of other cars but it still was a lot of money and the average American family couldn't yet afford to own one.

Increased Productivity

Ford continued to perfect his pioneering mass-production manufacturing techniques. Year by year he brought about increased worker productivity. He got the Model T down to \$350 by 1918, and to \$295 by 1922. By lowering the cost to the consumer, he boosted his volume tremendously.

Ford workers were the highest paid workers in industry at the time, and they received more when the car sold for \$295 than when it sold for \$950.

These brief looks backward 50 years are appropriate and helpful, it seems to me, as we ask the question today, "How free do we really want to be?" in this age of the piggyback and the fishyback, the airslide car and special containers and equipment of all kinds—and in this age of terrible squeezes on one kind of transportation or another.

These backward looks at once remind us of how far we have come, and of the means by which we have achieved so much. The competition of a new way with an old way has never failed to spawn its full share of problems. It has never failed to produce the sharpest of contrasts between those who survived and those who did not.

But also it has unfailingly opened new doors of opportunity and produced new social and economic gains shared by everybody. The buggy manufacturer who lost out to the Model T had to find his comfort in the old saying, "You have to take the bitter with the sweet." And if he had what it takes, he probably wound up with an even better business making some kind of automobile accessory.

"Sweet are the uses of adversity," said the banished Duke in Shakespeare's play "As You Like It" and even though he had had his dukedom usurped by his younger brother, you will remember that the old Duke managed a pretty good life in the Forest of Arden—no gout, no cholesterol clogging the arteries, no hypertension, no ulcers; and he found "tongues in trees, books in the running brooks, sermons in stones and good in every thing."

"I would not change it," he said, and I wouldn't be at all surprised to find that this is the way the vast majority of Americans feel yet today about our competitive way of economic life, in spite of all the soothing svrup they have been offered by those who want the state—the other taxpayers, that is—to take care of them.

There are, after all, only two ba-

sic alternatives in choosing how we will get people to produce goods and services. One is to have incentives, competition, and free choice by the individual as to what he will do. The other is to employ the force and the police power of the state to direct the creative activities of the individual.

The free way was America's early choice, and we shouldn't forget that it has turned out to be the only social system ever developed by man which makes possible the production of sufficient wealth to provide care for the weak, the incompetent, the disabled, the unfortunate, the insane and other non-producing members.

Under the other system, sometimes so much admired by a few of our fuzzier-thinking friends, the liquidation of non-producers goes on all the time.

This is a frightful truth we could afford to repeat a good deal oftener than we do.

I have a friend, a successful farm businessman in this state, who recently departed on a visit to Russia. I was astonished to learn, in talking with him before he left, that he had no comprehension whatsoever of the fate that had befallen all farmers like himself under the Communists in Russia.

He did not appear to know that in 1921 Lenin had to resort to a mildly capitalistic program called the NEP (New Economic Policy) in order to put the Russian economy back on its feet after the Revolution.

But then when Lenin died in 1924, and Stalin won out over Trotsky, the days of the farmers were numbered. They were producers, but they weren't the right sort of producers. My friend had never heard of a "kulak," which was the Russian name for people like himself, independent operators on the land.

The Columbia Encyclopedia puts it all in two brief sentences: "The first five-year-plan was inaugurated in 1928. The kulak class—the land-owning farmers who had grown prosperous during the NEP—was liquidated by drastic means."

As we all know, the means were drastic enough. They did the entire job in just one winter. The Soviets just took the farm produce—all of it—and let the farm families starve to death. First the farm animals disappeared, finally even all the dogs and cats and then the people. And this cleared the way nicely for the collectives which the government installed on the vacant land in order to get production—the kind of production desired by the state.

The Western Formula

How differently we have done things in the West! And what is the heart—the key—to our precious formula? For an answer to this, we have recent words of wisdom from another part of the old world, the old world that has been punished and pounded flat twice in our lifetimes in terrible wars.

The architect of the miracle of rebuilding West Germany after the last war is Ludwig Erhard, minister of economics in the Bonn government. Here is what he says in his recent book, "Prosperity for All":

"The most promising means to achieve and secure any prosperity is competition. It alone will be responsi-

ble for the universal benefits of economic progress because it constantly eliminates the disadvantages of stagnation and disincentives to production. 'Prosperity for all' and 'prosperity by competition' are inseparable; the first postulate indicates the aim, the second the means.

"It seems to me much more useful to bring about prosperity through economic expansion than to expect prosperity from a barren quarrel about a so-called redistribution of wealth. Let us make the cake larger to insure a 'prosperity for all'."

Basically I feel America agrees with this philosophy, because we have been able to make it work so well for the common good.

In order for it to work, however, there has to be a favorable political climate, and we now have the interesting problem of how to deal with some of our more vocal citizens who seem bound and determined to change that climate for the worse.

I am not speaking here in any partisan sense, because in our successful two-party system we need basic agreement on this philosophy in both political camps.

But there's more to it than just this basic agreement. What do we do with this brain-washing flood of trite sayings and pat slogans that attempt to do a snow-job on America discrediting our system and urging government action as the complete answer to all ills?

A Canadian friend said to me some years ago, "We've got to use the tactics of the demagogues to put across the truth."

A century and a half earlier the German genius Johann von Goethe said it this way:

"Error Is Dominant"

"Truth must be repeated again and again because error is constantly being preached round about us. And not only by isolated individuals, but by the majority! In the newspapers and encyclopedias, in the schools and universities, everywhere error is dominant, safely and comfortably ensconced in public opinion, which is on its side."

If public opinion today is on the side of error, it's people like you and me who have ourselves to blame, unless we've done our utmost to follow Goethe's advice.

So let me come to some examples of where I think we can get in some good licks on the side of truth.

Take this idea of "parity." You see and hear reference after reference to parity as a "fair" price, yet it is really nothing but an index—a statistic—to compare today's values with those of some past period.

Parity as an Index

The original idea behind parity was to express the same relationship between farm products and other goods as existed in 1910-1914, a period of relative stability in the farm economy.

Obviously, if Henry Ford had been held to a "parity" basis, he would have had to sustain his \$950 price on the Model T, or perhaps even raise it—not cut it down to \$295 in 13 years. He would have sold a lot fewer Model T's, he wouldn't have been able to raise wages as he did, and he wouldn't have made as much money for his company either; but he would have had "parity"!

What a sad formula that would have been for a dynamic and growing America!

Here's another interesting fact about a 1914 parity: In 1914, rib roast was only 20¢ a pound; but it took 48 minutes of labor by a factory worker to earn the money to buy a pound of it. Today it takes 20 minutes or less.

In 1914 bacon was 27¢ a pound but it took an hour and five minutes of labor, as opposed to 19 minutes now. A loaf of bread cost only 6¢ in 1914 but it took a worker three times as long to earn it as it takes today.

A real application of a parity rule

*From recent address before Northwest Shippers Advisory Board, Duluth, Minn.

EDITOR'S NOTE

Mr. Kennedy's discussion of the basic considerations of freedom are broad in scope and applicable to the agricultural chemical trade along with most other business enterprises now operating in the U.S. We thought our readers would gain a fresh viewpoint from looking over this thoughtful work.

across the board would say to the city worker: You're getting your bread too easy—you'll have to work three times as long for it, just as you did in the good old days of 1914.

How many votes would a parity program like that get in Congress?

The real truth is that America has progressed through a reduction of the labor required to gain a good living. This comes about through producing things better and cheaper. This is the way it worked with the model T, and this is the way it is working with farm products too, in spite of all the frantic maneuvering in the political arena.

The farmers who are producing desirable products better and less expensively for the consumer, are prospering, even at a time when many of their neighbors are losing out.

I doubt if there ever was another time in America when such a great and sharp contrast prevailed in farming, between those able to succeed and those less able. A mere one fourth of the farms in this country today produce four fifths of the farm output, and these same farms could easily produce the other fifth.

Competition is working. The commercial farm operators of the nation are doing a magnificent job, and the whole nation is the better for it. Others who are less successful at farming are going into other and more favorable pursuits, and this has been going on to some extent in the U.S. since the 1880's.

Most commercial farmers — and over 96% of them continue as in the past to be truly family farms—really like this competitive system, and if they have their way we'll keep it. I rather think they'll have their way too, as indicated by recent controversial votes in both the U.S. House of Representatives and the Senate.

"The huge profit of the middleman" is another completely phony issue waiting for the pinprick of truth.

There are organizations that behave as though they had a sort of vested interest in farm misery. By that I mean that when they find a farmer who is having a tough time meeting the competition of his fellow farmers, they try to get his support—and his vote—by pointing to some big bogeyman as the cause of all his troubles.

Thus, we middlemen come in for a real 'snow-job' by the brain-washers.

If only our profits could be divided up and distributed among the farmers and the consumers, everything would be rosy, or so the story goes.

Item: In some food trades, it's a good year when profit can be as much as 1% of sales.

Item: The USDA found that all the profits of processors and distributors alike, in the entire food business, add up to around 3¢ total, out of the consumer's dollar.

Added item: The good jobs, at good wages, of about 40% of our national labor force, working in the food industry, make mighty good customers for farm products.

The phony claim: Middlemen are evil. The truth: They are part of a great and valuable team effort, bridging the long gap between the farm business at one end and the family dinner table at the other.

I happen to be familiar with these examples I have mentioned, because I work in the field of agriculture.

You can all think of many more similar examples.

Let me give you one more quick one, on the subject of controls. There's a soft-soap word if there ever was one: "Control"! Some of our political leaders keep telling us the farmers want "controls" so they can set prices without regard for the consumer.

Example of "Controls"

You can see how ridiculous this is by considering an example of how controls really work: Take the case of burley tobacco:

In 1944 when acreage controls were applied to burley tobacco, it was decided that one acre would be the very minimum allotment which anyone should have (or 25% of his cropland, if less).

In the 11 years from 1944 to 1955 these things happened:

The market for burley tobacco increased 8.3%.

The number of growers of burley tobacco increased 21.9%.

The average per acre production of burley increased 26.2%.

By 1955 the average acreage allotment was down to 1.01 acres. In other words, the average was down to the minimum which had been set 11 years earlier. The minimum acreage allotment had been cut to 0.5 acre (or 10% of cropland, if less).

In 1955 two thirds of the growers of burley tobacco received minimum allotments of 0.6 acre or less. And they were still raising too much burley!

Don't you think the fellows who advocate this kind of stupid arrangement for the wheat-raising business must have some motive up their sleeves other than the one that appears on the surface?

Of course, the toughest part of turning to the police power of the state to control our economy, instead of letting the consumers do it in a competitive market, is that the system just isn't flexible enough to keep up with the times.

This brings about the kind of mess the railroads are struggling with in today's transportation situation.

Perhaps "way back when," there was something good to be said for government regulation and control to help produce orderly competition among the nation's railroads. Today as we have seen, regulation operates to throttle one kind of transportation in favor of another. It stifles competition instead of nourishing it.

The June issue of Dun's Review gave me this quick balance sheet on the 1957 freight business: 630 billion ton-miles on the rails; 75 billion ton miles by intercity common carriers on the highways; 123 billion ton-miles by barge on rivers and canals; 118 billion ton miles on the Great Lakes.

By now the whole nation is becoming aware of the effect government has had on this picture—the burden of taxes by government, the shape of regulations and restrictions by government.

But the picture is not complete without mention of the area that disturbs us most of all in agriculture—the trucker posing as a private carrier to evade ICC regulation.

In a recent presentation, Earl Smith of the Department of Defense quoted estimates of the effect of the ICC agricultural exemption in these words: "... that the U.S. freight bill for exempt and private carriers is equal to that paid to the entire railroad industry."

Preservation of Balances

We in our company are, of course, vitally aware of this situation. We are hoping that as the railroads step out to meet it, as indeed they must, some balances can be preserved between the raw product and the manufactured product, so that whole segments of our industry, built up in a competitive pattern geared to the use of storage-in-transit and milling-

in-transit, can avoid being left high and dry.

We know this isn't going to be easy, because there are political considerations to be dealt with along the way. We're familiar with this kind of situation, because we have the same sort of burden laid upon our operations by an outmoded government favor granted our competition.

It's a very big favor, amounting to as much as 55% of everything we manage to earn.

As in every industry, our survival depends on our ability to provide better and better tools for our men to work with, so they in turn can have better and better jobs and we can keep ahead of the competition by producing more and more service for less and less of the consumers' dollars.

Take an example of such a tool—a grain dryer costing around \$100,000. For our competitor to pay for a \$100,000 dryer, he has to accumulate out of earnings just \$100,000. But for us to pay for a \$100,000 dryer we have to accumulate \$222,222 out of earnings because it takes that much for us to have the \$100,000 left after corporate income taxes. Even depreciation cannot possibly make us whole in this inequity.

And this is the situation we face in the purchase of every tool we provide to our men, in the form of capital investment.

You can see why we're proud of our company and the job it does—we have to be much more efficient than our competitor in keeping our tools and equipment up to date, just to even up the ridiculously inequitable burden put upon us by the police power of the state.

Yes, we understand most sympathetically the problems of you transportation folks who have become enmeshed in a similar tangled skein of well-meant but hopelessly outdated government entanglements.

A friend whom I invited to make suggestions for this talk wound up his note to me in these words: "Every time we start monkeying around with economic legislation we hurt someone while we're trying to help someone. Offering one person a privilege almost always results in another person's losing some freedom."

How free do we really want to be? Our individual words and actions will speak for themselves.

I have suggested that if we have faith in the democratic process—and I surely hope we all do—there is a great deal we can do to keep America free and competitive, simply by

telling truths as often as the other guy tells his big fat lies.

The power is in the people. The role of the man in political life is like that of the man in Paris, at the height of the French Revolution, who was seen by a friend to be following a whole mob of people down toward the barricades.

"Don't follow that gang down there," the friend pleaded. "There's danger there! You may be killed!" To which the man shrugged his shoulders and replied, "But I must follow them—you see, I am their leader."

Our social-minded Congressmen will change their songs soon enough, when they discover the people understand the economic facts of life. So our target for bullets of truth, fired over and over and over again, is people—all people, and especially young people.

Remember we have the most powerful ally we could hope or ask for. The very essence of the Judeo-Christian religious idea is to lay responsibility on the individual, not on the group.

You find very little reference to the state in the Sermon on the Mount.

"Let your light so shine before men, that they may see your good works!"

Wool Growers Take Steps To Eliminate Weeds

SAN FRANCISCO—The California Wool Growers Assn. passed a resolution at its convention here Aug. 15 calling for a comprehensive weed control study.

The resolution said that yellow star thistle, medusa head, puncture vine, goat grass, Italian thistle and other destructive plants constitute an increasing menace to the production of forage for livestock and other important agricultural crops. It also stated that the weed encroachments result in hidden production costs which are a serious burden on the producers.

The association recommended that the weed control and elimination programs be undertaken "by those best qualified in the fields of research in conjunction with the weed control committee of the California State Chamber of Commerce."

REMEMBER TO ORDER

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Potash "Buy-Early" Program Makes Brisk Business, Firms Say

WASHINGTON — Potash industry sources here this week tell Croplife that the "buy-early" campaign for potash is hitting top levels of sales. The farm community buyers are grabbing for August-September bargains.

Industry sources here say that early orders are substantially heavier than a year ago, possibly attracted by attractively lower prices but the volume of sales is swamping office staffs.

It is possible, in this particular instance, that this increased volume may in part be influenced by labor difficulties affecting other companies, but separate reports indicate that the buy-early campaign for farm fertilizer materials has taken hold in a big way for all fertilizer components and that forward orders are breaking records.

1958 Sees Reduction in Oregon Fertilizer Sales

SALEM, ORE.—Fertilizer sales in Oregon during the first six months of 1958 are running slightly behind the record breaking 1957 figures, the Oregon state department of agriculture reports.

J. D. Patterson, state chemist, said on June 30 this year, 132,511 tons of fertilizer had been sold in the state. At the same time in 1957, 138,926 tons had been sold. These figures included simples and mixes.

Figures taken from inspection fee reports made to the department show sales of agricultural limes increased about 10,000 tons over last year's June 30 total. Six months sales in 1958 were 27,700 tons.

A smaller quantity of agricultural minerals, including soil sulfur, borax and gypsum, was sold in 1958. This year 11,233 tons were sold by June 30; last year the figure was 13,091 tons.

COMMITTEE

(Continued from page 1)

promote demonstrations for optimum results.

The group concluded that the NPFPI can render more valuable service through encouraging development of better demonstration methods, than by using funds directly to help establish demonstrations. As more effective techniques are developed, the committee decided, local groups, working with appropriate agricultural agencies would support the actual work of putting out demonstrations.

In addition to naming Mr. Cox as chairman, the Committee also named Perry Onstot, Davison Chemical Co., Division of W. R. Grace & Co., as alternate representative to the steering body, and elected Dr. Willard H. Garman, Northeastern regional director of

the National Plant Food Institute, as secretary of the committee.

Present at the New York meeting in addition to Mr. Cox, Mr. Onstot and Dr. Garman, were: W. R. Allstetter, vice president, National Plant Food Institute, Washington, D.C.; Merle Adams, NPFPI Northeastern district representative; W. E. Angstadt, Reading Bone Fertilizer Co., Reading, Pa.; Dr. Murray McJunkin, U.S. Steel Corp., Pittsburgh, Pa.; George Serviss, GLF Soil-Building Service, Ithaca, N.Y.; Dr. Harry Stangel, Nitrogen Division, Allied Chemical Corp., New York; and Dr. E. S. Younts, American Potash Institute, Washington, D.C., filling in for Dr. E. T. York of API.

Other committee members include Myron Keim, Virginia-Carolina Chemical Corp., Richmond, Va.; R. W. Donaldson, Hubbard-Hall Chemical Co.; and George Lippincott, Dorchester Fertilizer Co.

Tentative plans were made for a fall meeting of the committee to advise on plans for the 1959-60 program of the National Plant Food Institute.

WORLD REPORT

(Continued from page 5)

South Africa to name only three of the countries involved, for there are many, many more similar developments the world-over.

The Greek government has described its project for a fertilizer plant as one of its most important post-war developments. Two companies have been invited to participate in the construction of the new plant at Ptolemais. They are the Italian company of Ammonia Casale and the German Ude.

The cost of the project has been put at the equivalent of \$98 million of which upwards of \$23 million will be in foreign funds, the rest in local currency. About half of the foreign exchange cost will be met by a loan from the U.S. Development Loan Fund of \$12 million to be repaid over 12 months in drachmae.

Ptolemais is the site of the Bodasakis lignite mines which will feed the nitrate plant. Capacity of the facility will be 75,000 unit tons of nitrates a year, equal to 350,000 tons of nitrate fertilizers. Such an amount more than covers current Greek needs.

Briefs . . .

Fertilizers will be prominently displayed at the Comptoir Suisse—a trade exhibition—to be held in Lausanne Sept. 13-28.

• • •

The International Cooperation Mission to Paraguay has asked manufacturers of fertilizers, insecticides, fungicides and herbicides to provide catalogs. They should be addressed to the U.S. Operations Mission to Paraguay, Attn.: Procurement Officer, Department of State, Washington 25, D.C., marked "Official Shipment."

• • •

The fertilizer factory at Moron, Carabobo, Venezuela, is now producing in the region of 175,000 metric tons of fertilizer a year. Three years ago Venezuela was using only 17,000 tons of fertilizer a year. In 1956, usage went to 40,000 tons and 100,000 tons is now on the horizon.

Good Pastures Noted


SACRAMENTO — California's ranges and pastures were reported in better shape in August than at any time since 1941.

The California Crop and Livestock Reporting Service said in its range report that feed was becoming short in some areas but would be sufficient to carry available livestock for the rest of the grazing season.

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SMIROW is the quality, natural organic supplement to chemical plant foods.

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because it provides for *controlled release* of plant nutrients for health, steady growth and good color. SMIROW Tankage is 100% natural organic.
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because it is plainly visible in fertilizer — they can point to it in selling *your* brand.
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for all these reasons. SMIROW Tankage provides a built-in sales stimulant in a time of keen competition.



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Let us figure the cost of SMIROW tankage delivered to your plant.

Protecting Your Business Against Dishonesty

By Winston Mergott, Vice President, Liberty Mutual Insurance Co., Boston

Each year dozens of small firms are driven into bankruptcy by business dishonesty. Every week thousands more suffer losses of this nature which should have been profits. Any going concern is a potential victim. Having been lucky in the past doesn't mean that you can throw caution to the winds in the future any more than having once set up a protection program relieves you of the need to check regularly on its scope and effectiveness. Protecting a business against dishonesty is a perpetual, and a profit-making responsibility of management.

EMPLOYEE DISHONESTY: Losses caused by dishonest employees are always the most difficult to prevent or detect. In addition they frequently result in unfavorable repercussions on the financial structure of the business. And, occasionally, they are very expensive to unravel. Therefore, independent audits of books and records by a reputable firm of public accountants should be made at least once a year, and preferably more often.

Moreover, all employees holding positions of trust should be required without exception to take a vacation at least once a year. This requirement, in many cases, has led to the disclosure of previously unsuspected conditions that could have resulted in substantial losses.

• **Character and reference checking** on each prospective employee is the first step. This helps to weed out those whose job histories are unfavorable. When possible, records of past employments for an unbroken period of 10 or 15 years should be reviewed. Unaccounted for gaps sometimes hide prison terms or dishonesty in a previous employment. Former business associates, banking references, and community acquaintances are important sources of pertinent information.

Ability to live within income and conform to an acceptable mode of living are also good yardsticks for measuring a person's desirability as an employee.

The chief source of loss from dishonest employees is from the trusted person with an unblemished record. Such a record, of course, is an indication that a person is honest—up to a point. But that point is reached when the pressure for more money overcomes resistance to a tempting opportunity to embezzle.

• **Payrolls** may be padded in various ways: Timekeeping records may be manipulated. Fictitious employees may be carried. If the same person who prepared the payroll actually pays the employees, there is always the possibility of fraud either independently or with others. Hence, payrolls should be prepared by a method which requires an independent check by someone other than the person in direct charge of the work.

New names should never be added to the payroll without proper authorization. Accurate time keeping and supervision are likewise important.

A paymaster should have custody of payroll funds only during the paying-off period; undistributed envelopes should be turned back to another person for safekeeping. With-

out these precautions, the opportunities for fraud are great.

• **Purchase orders** should be serially prenumbered and have duplicate and triplicate copies of different colors to facilitate identifications. The use of unnumbered purchase orders increases the possibility for unauthorized purchases to be made without immediate detection. Purchase order blanks should not be left exposed where they might be misappropriated.

• **Sales slips** also should be serially prenumbered in book form. Receipts should be obtained from each salesman to whom they are given, and an audit of the numerical sequence of the sales slips should be made at least weekly. Unnumbered sales slips are frequently used in giving customers a receipt for cash sales which are never entered on the records.

• **Cash collections**, whether made by salesmen or others, should be carefully supervised. Again prenumbered duplicate receipt books should be provided for each collector and a

list maintained of the numbers and persons to whom books are issued.

Invoices and statements of account should include a legend telling the customer to expect a signed company receipt for all payments. Receipt books should be audited at least weekly with special attention to numerical sequence and to any indications of alterations on the duplicate copies. If no receipt is required, a collector is afforded an opportunity to take the cash and cover his dishonest act by kiting accounts. Also, if the customer is billed for the outstanding amount, ill will and a loss of business may result.

• **Accounts receivable** should be collected with reasonable promptness. Monthly statements should not be routed to customers via the regular collector, but instead, should be mailed directly. All customer accounts should be confirmed periodically by mail or personal contact. These procedures help to prevent fraudulent practices and possible collusion between collectors and the employee who posts the accounts receiv-

able. Furthermore, all receipts should be turned in for deposit daily by each salesman or collector. Duplicate copies of deposit slips should be certified by the bank teller and mailed by the bank to the employee who reconciles the bank accounts. Without such controls over collections and deposits, an opportunity exists for employees to embezzle.

• **Disbursements**, when possible, should be made by prenumbered check rather than in cash. More effective safeguards are thus available over disbursement procedures. Also, the amount of cash-on-hand necessary to conduct the business can be kept at a minimum.

• **Petty cash funds** should be operated on the imprest system—a fixed amount of sufficient size to cover one week's requirements, subject to replenishment to the precise extent of disbursements. Defaulters often start in a small way by borrowing from these sources. Properly approved vouchers should consequently be required for each payment with amounts written out in ink or typewriter to verify the numerals.

At the time of reimbursement, vouchers should be canceled with a dated "paid" stamp. Audits of this fund should be made at irregular intervals on a surprise basis.

Imprest funds generally provide simple and effective controls over the amount of currency available to a cashier and assure subsequent accountability. Frequent unannounced audits of petty cash tend to decrease the hazard of manipulation.

• **Countersignature on checks** drawn for more than a specified amount (perhaps \$250 or \$500) should be required. And justifications supporting all such expenditures should be available for review by those who sign the checks. Substantial losses have resulted when the person authorized to sign checks did not have adequate means for judging the propriety of the checks presented for his signature.

• **Reconciliations of bank accounts** should be completed promptly by an employee other than one who prepares the deposits or signs checks. Delay in reconciling the bank account may serve to cover up at least temporarily, fraud, forgeries, or alterations made by employees or outsiders.

• **Physical inventory** should be taken at least once a year and preferably quarterly or semi-annually. It should include a spot check of the merchandise packed in boxes, bins, cases, and the like. Valuable goods which may easily be pocketed should be kept under lock and key. Constant observance by supervisors is necessary, if losses through pilferage or errors in handling stock by inexperienced or careless employees are to be avoided. Consistent control over inventory should disclose shortages which are caused by employee thefts or inaccurate accounting.

• **Perpetual book inventory** should be utilized in addition to periodic physical inventories. This procedure calls for keeping track of receipts and shipments, and also furnishes valuable data for reordering stock. It can be used in locating inventory shortages at reorder point by comparing book inventory with actual stock on hand.

• **Scrap and waste material** should be subject to continuing control as to quantity, value, and disposal in

(Turn to BUSINESS, page 14)

SHOP TALK

OVER THE COUNTER



By Emmet J. Hoffman
Groplife Marketing Editor

An imaginative approach to farm merchandising has been building volume for Zimmer's Farm Store, Boyertown, Pa. Henry P. Zimmers, owner, has been moving his store out to the farm.

Five days out of seven, a section of his store rolls out on wheels to serve some 200 or more farms in a 15-mile radius around Boyertown.

The mobile store is a new Dodge delivery truck with a functional, cab-forward Merchandiser body manufactured by Boyertown (Pa.) Auto Body Works, Inc. Shelves and bins have been installed down both sides of the interior, leaving a broad center aisle for shopping. The aisle is equipped with dome lights and heater.

"As far as we know, we've got the only service of this kind in the area," Mr. Zimmers says. "We can put 150 different items in the truck and we roll right up on the land with the stuff we know the farmer needs all of the time."

Mr. Zimmers said sales are growing steadily, and that 10 people are kept busy in the mobile store and the store in Boyertown. The firm does a substantial wholesale business, and operates three trucks in addition to the mobile store.

The firm opened for business under the present management four years ago. Until a year ago, it used a station wagon as a mobile store.

The station wagon had its disadvantages. "We carried 30 or 40 items in the wagon," Mr. Zimmers said. "Things were piled every which way. But with the Merchandiser we can actually display our merchandise just as we do at the main store."

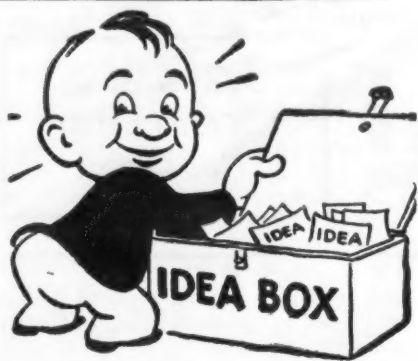
Salesmen operating the mobile store bring their customers right into the truck which results in their seeing "a lot of things they need but ordinarily wouldn't ask for out of a truck," he said. "In the old wagon we might ask a farmer about seed,

and, chances are, he'd need some. But if we didn't have it right on the wagon he'd say, 'Oh, I'll pick it up myself later,' rather than order for future delivery. Being able to stock a wide variety of merchandise in the field has increased our sales a lot."

Special equipment and supplies have become profitable items in the new mobile store. It stocks a portable egg washer, for example. It is compact, measures only 20 in. by 20 in. and retails for \$19.95. Five or six of these are sold each week. The mobile store also moves a full case of filter disks for straining milk during its regular five-day selling cycle.

On the sixth day, the truck is moved to the Gilbertsville Auction in the trade area.

"From 25,000 to 50,000 people pour in and out of the auction every Saturday," he said. "The store is rolled up beside our regular booth. We do a good business in farm chemicals and other important supplies. And it's good advertising. We have the truck decorated on both sides like a billboard. Many people stop at our regular store in Boyertown because they've seen our truck at the auction."



What's New...

In Products, Services, Literature

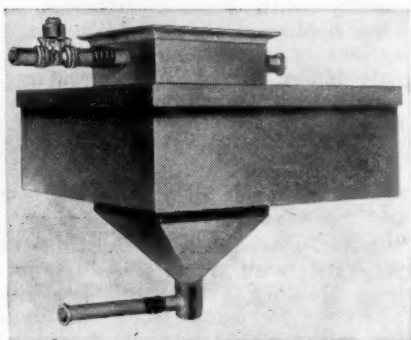
You will find it simple to obtain additional information about the new products, new services and new literature described in this department. Here's all you have to do: (1) Clip out the entire coupon and return address card in the lower outside corner of this page. (2) Circle the number of the item on which you desire more information. Fill in your name, your company's name and your address. (3) Fold the clip-out over double, with the return address portion on the outside. (4) Fasten the two edges together with a staple, cellophane tape or glue, whichever is handiest. (5) Drop in any mail box. That's all you do. We'll pay the postage. You can, of course, use your own envelope or paste the coupon on the back of a government postcard if you prefer.

No. 7120—Tag Coding Wheel

A new addition to Mill Engineering Co.'s line of tag dispensing and coding equipment is the Quick Change Coding Wheel. The quick change is accomplished by metal code holders. The new wheel contains three holders for the metal strips, making it possible to print three types of information simultaneously, such as code, type feed and hormones or medicants. The bag tagger automatically dispenses the tag into the sewing machine for each bag and the coder accessory prints code and other information on the bag simultaneously. Full information can be had by checking No. 7120 on the coupon and mailing it to Croplife.

No. 7124—Batching Scale

A constant feed-batching scale which utilizes an electronic closed circuit control has been announced by Thayer Scale Co. The company announcement said the electronic control provides dynamic accuracies without a dead spot and claims final accuracies of 0.1% for wet or dry materials being fed at rates of from 5 lb. to 5 tons per hour. No mechanical parts subject to wear are found in the control system. The closed loop



system will maintain constant speed control over a long period of time, the announcement said. Feeders are available to handle viscous or lumpy material, and by substituting a controlled orifice valve for the dry feeder, liquids can be weighed. For more information, check No. 7124 on the coupon and mail it to Croplife.

No. 6793—Pipe

"Fibercast" line pipe and well tubing are now being produced in 4½ in. O.D. size, according to an announcement by the Fibercast Corp. "Fibercast" is a non-corrosive pipe made from thermosetting reinforced epoxy resins, producing a pipe that takes high operating pressures and temperatures, yet being 4½ times lighter than steel, the company claims. Its officials state: "After several years

of extensive and vigorous field tests, Fibercast was introduced in 1953 in sizes of 2½ in., 2¾ in. and 3½ in. Its successful applications in the petroleum, chemical, paper and fertilizer industries—particularly where severe corrosive conditions exist—brought about the demand for the larger 4½-in. size." Secure details by checking No. 6793 on the coupon and mailing it to Croplife.

No. 6791—Fertilizer Bagging, Shipping

A new bulletin covering fertilizer bagging and shipping equipment has been prepared by the K. E. Savage Co. The bulletin explains and illustrates a shipping mill for bagging large volumes of fertilizer, a sewing machine stand, horizontal and inclined belt conveyors, truck loading conveyors, and industrial design information. The bulletin may be secured by checking No. 6791 on the coupon and mailing it to Croplife.

No. 6792—Adjuvant Activity

A leaflet titled "Adjuvant Activity in the Agricultural Chemical Field" has been prepared by Colloidal Products Corp. The leaflet describes Kelthane (Colloidal X-77—Colloidal Z-1). Results of field investigations are presented in the leaflet. Secure it by checking No. 6792 on the coupon and mailing it to Croplife.

Also Available

The following items have appeared in the What's New section of recent issues of Croplife. They are reprinted to help keep retail dealers on the regional circulation plan informed of new industry products, literature and services.

No. 6788—Hand Sprayer Literature

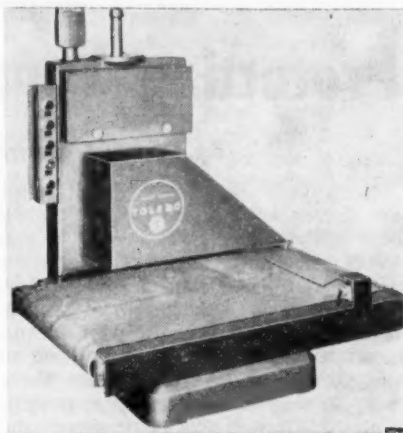
The B & G Co. has produced a descriptive folder and price folder for its hand sprayers. Sprayers from the ½-gal. size on up to the 2-gal. size are described. Various accessories such as nozzles, tip assemblies, valves, pump units, carrying straps and repair boxes are also described. Check No. 6788 on the coupon and mail it to secure details.

No. 6787—Spreader-Activator

A folder titled "Colloidal X-77 Spreader-Activator" for use with herbicides, insecticides, fungicides and acaricides has been published by the Colloidal Products Corp. Colloidal X-77 is water soluble and the folder lists its characteristics which make it suitable for various farm chemicals. Check No. 6787 on the coupon and mail it to secure the folder.

No. 7111—Automatic Checkweigher

A new higher capacity "Toledo" automatic checkweigher, designed to govern uniformity and control costs by maintaining a constant check of items passing over the unit, has been announced by Toledo Scale, Division of Toledo Scale Corp. The unit, iden-



tified as a model 9460, is capable of handling packages or bags weighing between 25 lb. and 200 lb., with an accuracy of .1%, it is claimed. Equipped with a belt-type motorized conveyor weigh section, items pass over the unit at a rate of approximately 20 per minute and are checked "on the run" against a predetermined weight. Check No. 7111 on the coupon and mail it to secure details.

No. 6784—Product Cans

An illustrated, two-page bulletin to help the packager of dry, semi-liquid or liquid products select a can for these products has been issued by George D. Ellis & Sons, Inc. Thirty eight different types of cans are shown in the bulletin, called product memo No. 112, and they are broken down into three different categories: Round cans, round cornered square cans and round cornered rectangular cans. Check No. 6784 on the coupon and mail it to secure details.

No. 7046—Vibrators

The Cleveland Vibrator Co. has available literature showing the use of "air-cushioned" vibrators which are said to reduce noise by "cushioning the vibrator piston's thrust. A small amount of air is released ahead of the piston," the company explains. "This air creates a buffer as the piston moves back and forth, reducing noise to a minimum," it is claimed. Check No. 7046 on the coupon and mail it to secure details.

No. 6782—Livestock Insecticide

A new livestock spray insecticide called Co-Ral is described in detail in a six-page folder prepared by the Chemagro Corp. The folder contains information and test data on the effectiveness of the new spray material against cattle grubs, screw-worms, hornflies, lice and ticks. The life cycle of cattle grubs and screw-worms are shown along with spray application instructions for the use of Co-Ral against all major livestock insects. The product, researched as Bayer 21/199, has recently been registered by the U.S. Department of Agriculture for use on beef cattle, horses, sheep, swine and goats. The folder may be secured by checking No. 6782 on the coupon and mailing it to Croplife.

No. 7152—Settler Packer Attachment

An attachment for bag packers which is designed to settle material in the bag during the entire filling cycle without affecting the weighing mechanism of the packer has been announced by the H. L. Stoker Co. The model "B" settler features adjustments to control the intensity and frequency of the settling action to

Send me information on the items marked:

- | | |
|--|--|
| <input type="checkbox"/> No. 6782—Insecticide | <input type="checkbox"/> No. 6792—Adjuvant |
| <input type="checkbox"/> No. 6783—Compacting Process | <input type="checkbox"/> No. 6793—Pipe |
| <input type="checkbox"/> No. 6784—Product Cans | <input type="checkbox"/> No. 7046—Vibrators |
| <input type="checkbox"/> No. 6785—Crop Dusting | <input type="checkbox"/> No. 7111—Checkweigher |
| <input type="checkbox"/> No. 6787—Spreader-Activator | <input type="checkbox"/> No. 7120—Coding Wheel |
| <input type="checkbox"/> No. 6788—Hand Sprayer | <input type="checkbox"/> No. 7124—Batching Scale |
| <input type="checkbox"/> No. 6789—Orchard Sprayer | <input type="checkbox"/> No. 7143—Bag Closer |
| <input type="checkbox"/> No. 6790—Coding Wheel | <input type="checkbox"/> No. 7145—Hoist Carrier |
| <input type="checkbox"/> No. 6791—Fertilizer Bagging | <input type="checkbox"/> No. 7152—Settler |

(PLEASE PRINT OR TYPE)

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COMPANY

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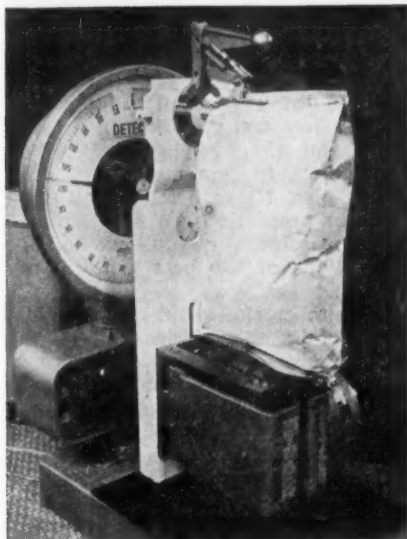
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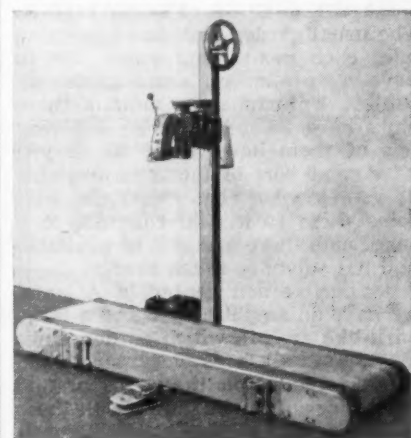


No. 6790—Coding Wheel

A new addition to Mill Engineering Company's line of tag dispensing and coding equipment is the "Quick Change Coding Wheel." The change is accomplished by metal code holders into which are placed the logo-type. The new coding wheel contains three holders for the metal strips, thereby making it possible to print three types of information simultaneously. The bag tagger automatically dispenses the tag into the sewing machine for each bag and the coder accessory prints code and other information on the tag simultaneously. Full information will be supplied to those interested. Check No. 6790 on the coupon and mail it.

No. 7143—Belt Conveyor Bag Closer

The Dave Fischbein Co. has announced the introduction of a new belt conveyor sewing unit, the "Fischbein Bag Closer model B-5." The unit operates from one 110-volt light outlet. No special wiring is necessary. The two-stage switch operation is controlled by foot pressure by the op-



erator. The first stage starts the movement of the conveyor belt to carry the bag to the sewing head, and the second stage starts the sewing operation. The machine stitches at the rate of 30 ft. per minute. Check No. 7143 on the coupon the mail to secure details.

No. 6783—Compacting Process

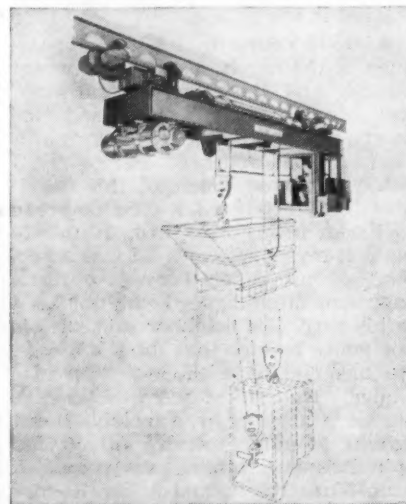
A compacting process for fertilizer has been announced by the Allis-Chalmers Manufacturing Co. The system uses compacting, granulating and screening equipment to transform once discarded salt fines into effective fertilizer particles, applied in the field with A-C fertilizer attachments such as the one shown here. The mechanical compacting system is in production in several plants in potash, coke-oven ammonium sulfate, diammonium phosphate, sodium nitrate and carbon areas. Common to these producers of inorganic salts has been the unavoidable production of finely divided particles which break off or fly away before they are available for use as fertilizers. In the A-C process, these fines are fed into a com-



pacting mill where they are squeezed into a continuous sheet. Broken into chunks, the product is then granulated to marketable size in a roller mill. Screens assure removal of undersized and oversized particles. Check No. 6783 on the coupon and mail it to secure details.

No. 7145—Hoist Carrier

A cab-controlled twin-hook hoist carrier provided with an auxiliary hoist for dumping has been built by the Cleveland Tramrail Division, the Cleveland Crane & Engineering Co. Of weatherproof construction for outdoor service, the unit will pick up



tote boxes of materials, haul them and empty by tipping. While the carrier was especially designed for handling slag in a steel mill, it is suitable for various bulk materials. Check No. 7145 on the coupon and mail it to this publication.

Earwigs Infest Parts Of New England Area

BOSTON—The biggest and most talked about insect infestation in Massachusetts this year is the European earwig. There are more of them in the state this summer than ever before, Dr. Ellsworth Wheeler, entomologist at the University of Massachusetts, reports. They have moved into houses and farms, through foundation cracks, behind shingles, through bulkhead doors and hide in towels and sinks.

The pest was first reported in Rhode Island in 1911, but it was not until 1933 that the first ones were reported in Massachusetts in Randolph and Avon. From this point they spread over the Cape and moved northwards. This year, they are reported in strength in the Worcester County area and for the first time have been located as far west as Pittsfield.

Until now, Maine, New Hampshire and Vermont have been free of the insects, but Dr. Wheeler reported that some have now been found in southern New Hampshire.

Midsouth Crops Reported In Excellent Shape

MEMPHIS, TENN.—Extension officials in the Mid-South report that crops are progressing well in Mississippi, Missouri, Arkansas and Tennessee. Officials in these states said that soybeans, corn, rice, cotton, and pastures all are in good shape.

The Arkansas agricultural extension service said that older soybeans are making excellent growth and blooming, and rice prospects continue favorable in all areas. Corn also is continuing to do well.

The Mississippi agricultural extension service reported a good outlook for soybeans, corn and cotton. Corn in most cases is described as the best in years.

A survey reported lots of blooms on soybeans throughout Pemiscot County, Mo., according to W. F. James, agricultural extension agent for the county. A good soybean yield was predicted by the official.

All crops throughout most of West Tennessee need rain, according to H. W. Luck, extension assistant agronomist at Jackson.

Cotton was reported doing well in all four states, despite insects which are doing general damage. Dry weather in most areas aided in cotton crop progress.

Gloomicides

Little girl concluded her nightly prayer with, "—and God bless everybody. And by the way, God, this is goodbye. Tomorrow we're moving to Texas."

★

"I want a man to do odd jobs around the house, run errands, and mow the lawn. I want a man who will never answer back and always do what he is told. Now, if you can do all this, the job is yours."

"Ma'am," said he, "you ain't lookin' for a handy-man, you're lookin' for a husband!"

★

The old grandfather clock was beginning to show its age, and Farmer Wilkins took it apart one day and tried to fix it. After a while, he was able to get it back together again, and it seemed to be as good as new. But in the early hours of the morning the clock went amok, striking 136 times before it finally stopped. Mrs. Wilkins woke with a start.

"Horace," she shouted, "you'd better get up fast. It's later than I ever knowed it to be before!"

★

He: "Whatever happened to that dopey blonde your husband used to run around with?"

She: "I dyed my hair."

★

"I'm not wealthy and I don't have a yacht and a convertible like Jerome Green," apologized the suitor. "But darling, I love you."

"And I love you, too," replied the girl. "But tell me more about Jerome."

★

A young man was having a hard time trying to decide what to give his new girl friend for a birthday gift. He wandered around a large department store, looking at various displays, until he saw the perfume display. Going up to the clerk, he said:

"I've got to get my girl a birthday present. Would you suggest perfume?"

"Certainly," smiled the clerk. "Every girl likes to get a bottle of nice perfume for a gift."

"What kind could I get her?" asked the man.

"Well," was the reply, "here's a new perfume called 'Maybe.' It's only \$50 an ounce."

"Fifty dollars!" exclaimed the man. "Listen, if I have to spend \$50, I don't want 'Maybe.' I want 'Sure Thing!'"

★

There was once a young man who told his lady love that he had never seen such dreamy eyes . . . and was left slightly disconcerted when she remarked tartly: "You've never stayed so late before!"

★

Starting a budget is a good way of facing facts . . . such as the fact that you don't make enough money.

★

A woman in a small Ohio town was gossiping with her friend on the party-line telephone. The usual clicks were heard as other listeners picked up their phones.

Suddenly, in the middle of the conversation, there came the unmistakable sound of a receiver being banged down on its hook.

"Well, I like that!" said the first caller with pretended indignation, "somebody hung up on us!"

★

One of the most difficult card tricks is to stop some people from doing them.

GARDEN CENTERS SUITED FOR

Merchandising Allied Lines

EDITOR'S NOTE: The accompanying article was prepared by W. Elbridge Freeborn, H. G. Hastings Co., Atlanta, for delivery as a talk at the Agricultural Dealers' Workshop at Louisiana State University. The information in the article has special interest for dealers of specialty fertilizers and other farm and garden chemicals.

It is our opinion that it is necessary to understand the psychological angles of the customer in a garden center before you can have the proper attitude to start a promotion. For that reason, it will be wise to define what a garden center is, and then define what a garden center customer is, before promotions are discussed.

What is a garden center? I believe that a garden center is a combination indoor and outdoor store that sells the products usually seen in a nursery, a seed store, a pet shop, a hardware store and a fertilizer company. Negatively, I would say that we are not talking about a seed store, a nursery, the sale of power equipment and hardware, but rather we are talking about an operation that is a combination of them all. But at least for the purpose of this subject, we are excluding the sale of merchandise for farmers and florists.

What is a garden center customer?

It is my opinion that before we can accurately describe a garden center customer, we are going to have to describe some of the changes that have come about, not only in merchandising but also in the attitudes and backgrounds of the customers. There are several factors, all of which you are familiar with, but for our purpose today perhaps they should be reviewed.

There are 10 of these factors that I would like to mention.

1. Most of us are familiar with customers that have a country or small town background. However, most—and certainly many—of our new customers, the new, young families, are people who are not from the country but are city bred, and they do not have a background of information as to how things are grown, either from seeds, plants or bulbs. Frequently, perhaps usually, they originated in other sections of the U.S. Obviously, these customers need more help and more information than the customer that we have become accustomed to serving through the years.

2. Population shift. For many years there has been a shift in population from the country to town, but now they are going to take a half step back . . . moving from the city to the suburban areas. This is true not only of the families, but also—because of this change in population—industry, offices, and warehouses, etc., are doing the same thing. No doubt the automobile is primarily responsible for this.

3. Slum clearance. Maybe slum clearance is a good thing for the city, but I do know that the elimination of individual houses replaced by a big project, whether it be owned by the government or by individuals, means that there is less profitable business left.

4. Income. Since the 1940s, our average income, both real and actual, has been increasing. Presently, there are changes in the other direction, but average income is still at a very high level.

5. Larger families. This is probably one of the most important factors in our future market, and also is important in our present-day market. The day of the one and two child family is obviously a thing of the past, and we are now in the period of the two to three child family, maybe just around the corner from the three to four child family. There is nothing we can

do about this on a national basis, other than to notice it with interest, but we can count on an expanding market in the future.

6. Do-it-Yourself. The disappearance of the handy man, the itinerant laborer and the itinerant gardener, has already taken place and the movement that is known as "do-it-yourself" has appeared. Personally, I don't think too much of this movement. I find that if I want a dogwood to bloom in my backyard, I have to plant it myself. Recently, I saw a cartoon of an eager beaver with an enormous ditch-digger being unloaded in his yard. His neighbor said, "He is not going to hire that ditch dug . . . He has bought a ditch-digging machine." That may seem ridiculous, but if you live in a neighborhood similar to mine, you are surrounded by homes with lots that vary in width from 50 to 100 ft. and in depth from 150 to 300 ft. Most of that lot is covered by a house, walk, driveway and a few bushes. The remaining portion has grass on it. Yet the average man in my neighborhood owns a power lawnmower that cost him from \$100 to \$400 and some of them even have riding lawnmowers.

7. More leisure time. Perhaps you are feeling sorry for yourself and think that you work a whole lot, but the fact remains that the average person in America today is working only slightly over 40 hours, while—as you well know—20 years ago if you could find a job you worked at least 48 hours a week.

The shortened work week and the five-day work week leave a vacuum of time to be spent, much of which will go to sports and hobbies, and America's No. 1 hobby is gardening.

8. The parking problem. We could spend considerable space discussing parking problems and why they exist, but for our purpose I will just make an arbitrary statement that I believe will stand. You must have parking, and an adjoining paid parking lot is not satisfactory to our present-day customer. You must have off-street, free, privately owned, controlled-by-yourself parking.

9. Gardening as a hobby. Your approach to this market must be that of a hobbyist and not the commercial approach. The man with a hobby is not interested in what things cost. What does it cost to catch a fish? What is a fish worth after it is caught? What does it cost to play a round of golf? What does a bottle of whiskey cost? How much would you pay for a leather golf bag? How much would you pay for a book entitled "Bird Watching"? How much did your camera cost? All of these people talk about money and what things cost, and they are going to talk about, "I bought a rose bush at 50¢ . . . you want \$2.50," but some of them are going to brag, "I paid \$2.50 so I have a better rose than you have." It's an emotional field. It isn't practical. Maybe it is more profitable.

10. Dressed and undressed. Most of us can remember the time when a lady wouldn't go downtown shopping unless she had on a hat. Some of us can remember when she wouldn't go downtown unless she had on a hat and gloves. It isn't that way in our garden shopping center in the summertime! The casual dress, the sport dress has taken over.

The average man in my neighborhood cuts his lawn wearing a pair of shorts and a pair of shoes with those lovely knobby knees showing that 10 years ago no one but his wife knew about. Just so dressed, he will hop into his car and come down to the garden shopping center.

Probably more interesting is the fact that—dressed in the same general manner—a young and beautiful wife will do the same thing. That's

what makes garden center operation so much fun in the summertime.

In summary here is what has been stated:

1. A garden center is the combination of a hardware store, seed store, nursery, pet shop, feed store and fertilizer warehouse.

2. The present-day modern garden center customer is educated . . . a Yankee . . . a do-it-yourself . . . a city slicker. He is fooling around with a hobby and wears casual clothes. He has an unbelievable belief in scientists.

I think the one thing that a good garden center must have, in addition to the usual sort of thing that we all know about that might be called good business practice (such as the proper location, good rest-room facilities, alert sales people, merchandise priced properly, proper delivery service, proper bookkeeping facilities for accounts receivable) is accurate authoritative information from a recognized gardening authority.

Promotions: Here are six types of promotions—(1) Garden club, (2) kinds of garden materials, (3) cultural practices, (4) merchandise demonstrations, (5) price, and (6) permanent demonstrations.

GARDEN CLUB PROMOTIONS:

The usual garden club has a meeting once each month and would like to have a speaker on some gardening subject. Unfortunately, most of these clubs have 15 or 20 women and very few of them have 50 or 60. If you have some sort of facilities available at your garden center you can welcome them to it, you can talk to a small club there and still be available and not waste so much time.

At our garden center in Atlanta, we have an amphitheatre and a large park-like area in which garden clubs meet, as well as a very large and comfortable porch that goes around three sides of the building. With these facilities we are able to invite garden clubs to come to our garden center for their meetings and it is a very simple matter to entertain, instruct, illustrate and demonstrate for them.

KINDS OF FLOWER CLUBS:

What I have in mind are those organizations that are interested in one kind of flower. Here, we are thinking of gladiolus, rose, azalea, camellia, African violet, and other similar societies. These organizations are anxious to promote their particular interests and you have a hand-made opportunity for cooperative promotions.

CULTURAL PRACTICES: This is one of the really great opportunities for promotion. Who knows what kind of bug eats up a petunia leaf? Frankly, I doubt very seriously if the petunia itself knows what ate it up, but all day long you are all but plagued with questions of this nature. How do you kill aphids? How do you control black spot? How do you kill weeds? How do you kill dallis grass? Do I fertilize now? Can I fertilize azaleas at the time they are planted?

There is a tremendous amount of ignorance and an even greater amount of mis-information about gardening practices.

A garden clinic for discussion of plant diseases and insects . . . a feeding clinic to answer those questions . . . a grass clinic which would include a discussion of weeds and weed control . . . These are three suggestions in the garden practices field that are definitely known to be attractive and worthwhile.

MERCHANDISE DEMONSTRATIONS:

Much of the garden equipment that is sold in garden centers needs demonstrations and most of the factories with power equipment have fairly good experts that will assist you in a demonstration of this type.

We have usually been able to work this into some need of our own. For example, if we wanted a Simplicity Manufacturing Co. demonstration, we would have it at a time when some area needed to be dug up with a Rotocul.

Lawnmowers, leaf mulchers, soil

grinders, tractors, all lend themselves to this sort of demonstration.

PRICE: What do your customers want to do? They want to buy something. They want to buy it cheaper from you than anybody else. You want them to pay more than anywhere else. Nevertheless, sales as a form of promotion are attractive to every customer that you have and are promotions of the best type, in my opinion.

Remember this about prices. While people talk about prices all of the time and ask you what the price of everything is that they purchase, there are only a relatively few items on which they are aware of the price that the merchandise should be. You should advertise those things in which there is widespread interest, and give special prices on that sort of merchandise.

PERMANENT DEMONSTRATIONS:

Beautiful lawn areas, beautiful camellias, beautiful rose beds, beautiful azalea beds, unusual shade trees, and just all kinds of fine or unusual planting material that is grown on your place, will be a permanent demonstration and a promotion of the finest kind.

All summer long we have people wander through our front lawn area, which is bordered with rose beds, taking down the names of the varieties that appeal to them. We advertise when something unusual or unusually pretty is worth seeing and we attract many people for this purpose.

We have discussed six kinds of promotions and there are probably another dozen, but we haven't mentioned a promotion for the pet department, which is one of the most attractive areas in a good garden center. There are clubs that promote all breeds of dogs and clubs that promote particular breeds; there are cat clubs, bird clubs, etc. You have all of those kinds of opportunities for promotions.

FACTORS IN PLANNING PROMOTION:

There are at least five very important factors involved that must have serious consideration when planning and executing a promotion. They are: (1) Advertising, (2) authorities, (3) government assistance, (4) growers and manufacturers, and (5) whose promotion is it?

ADVERTISING: It is our opinion that you will have to make up your own mind as to what kind of advertising you prefer to get the word out that a promotion of some kind is going on at your garden center. There isn't anything in the world the matter with radio, television, newspapers, handbills, and word of mouth, and if your enthusiasm thinks that the poorest one of these is the best, you will probably have a successful promotion using that kind of advertising. The only point of issue at this stage of the game is that you have to advertise. Most good promotions will stand big, flashy advertisements.

Our experience has been that over the years the best method of advertising is the daily newspaper, the second best is television (and it would be best if you could buy more of it but the best time is seldom available and the cost is very high), and probably the third best is radio, and the fourth best would be handbills and direct-by-mail advertising.

AUTHORITIES: In most of the promotions that we have had we have made an effort to have an outstanding authority discuss problems and this is most attractive. We always try to go "first class" on the first promotion that we have. For example, if we were planning our first garden clinic to discuss insects and diseases we would be sure that the two or three authorities that we had were the finest that could be obtained. After this garden clinic was off to its successful start and conclusion succeeding ones could be held with less talented authorities, but you have to be right the first time.

GOVERNMENT ASSISTANCE: thinking how nice it would be to lie in

(Turn to ALLIED LINES, page 15)



FARM SERVICE DATA

Extension Station Reports

Dutch elm disease is continuing to spread across Vermont and now can be found in "just about any part of the state," specialists report.

Raymond T. Foulds, Jr., Vermont extension service forester, said the heaviest infestation of the disease remains in the Bennington area.

The city of Burlington, with some 10,000 elms at stake, seemed to be holding its own. The Burlington park department reported only three confirmed cases and no new cases during the past year.

Mr. Foulds and John Scott, director of plant pest control of the State Department of Agriculture, agreed that prompt removal of infected trees is necessary to prevent spreading.

"Since elm bark beetles, which spread the fungus, breed only in elm wood that has become infected and on which the rough bark is still tight," Mr. Foulds said, "destruction of this wood holds down the local beetle population and reduces the amount of disease spread."

The extension forester explained symptoms of the Dutch elm disease to help tree owners spot it.

"Leaves of infected elms wilt, become yellow and turn brown," he said. "Then they fall."

"On a wilted branch about a half-inch in diameter, the bark may be peeled back to the wood. If diseased, the current or recent sapwood of the tree has a brown discoloration."

In combatting Dutch elm, Mr. Foulds suggested removal of any diseased elms that are dead or dying from any cause. He said elm wood or brush shouldn't be piled unless bark has been peeled and burned.

Another suggested control measure was spraying elms in April with DDT.

★

Midwestern agronomists suggest two ways to help new meadow seedings make thick, fast growth after the small grain harvest, according to the Midwest division of the National Plant Food Institute:

1. Clip all the straw from the grain fields after the crop is combined.

2. Top-dress the new seeding with fertilizer high in phosphate and potash, unless the seeding had a full feed of nutrients before planting. This will give the small legume plants the nutrients they need to develop strong roots and thick, healthy topgrowth.

"Wisconsin agronomists report new stands of alfalfa or red clover were greatly improved by clipping oats stubble shortly after the grain harvest," says a statement by the institute.

"Raking off all the residue after the stubble was mowed in some test fields, favored the alfalfa crop. The Wisconsin agronomists indicate that red clover was benefited by leaving a small amount of mulch to conserve soil moisture. Red clover, they point out, is less tolerant of drouth than alfalfa."

Ohio agronomists report that hay yields were boosted three quarters of a ton per acre in a three year test when the field was mowed once and all the wheat straw removed. Mowing the field a second time in late August and removing all straw, resulted in a yield increase of 1,810 pounds.

Removing straw helps get rid of the danger from fungus and molds encouraged by dampness under the straw, the institute points out. These

fungus and molds can sometimes destroy the new seeding.

★

Virginia farmers are continuing to take advantage of the soil testing facilities available to them.

W. W. Lewis, agronomist at the Virginia Polytechnic Institute agricultural extension service, reports that 46,890 soil samples were tested in VPI laboratories during the July 1, 1957-July 1, 1958, period. The slight decrease from the 47,507 total of the preceding year is explained by the wet spring and late planting season, Mr. Lewis says.

Of the total, 30,799 were regular soil tests, involving a measurement of pH, calcium, magnesium, organic matter, phosphate, and potash. The other 16,091 were ASC lime-requirement tests.

Mr. Lewis says the soil-testing lab at VPI is one of the most up-to-date in the nation, and its facilities are available free to landowners in Virginia. A soil test, he points out, helps the farmer make the most efficient use of lime and fertilizer and thereby save money and increase profits. Testing should be done now since this is a slack season in the laboratories. The rush season generally is from December through May.

The agronomist points out that the soil test can be no better than the sample submitted, so he urges farmers to take samples correctly.

Southampton County ranked top last year with 1,199 samples tested. Other counties high on the list were: Frederick, 999; Augusta, 942; Culpeper, 929; Pittsylvania, 921; Isle of Wight, 847; Nansemond, 827; and Fairfax, 818.

★

College specialists report there is increasing interest by farmers in harvesting oats for silage, or using it as a pasture crop for dairy cattle.

Purdue University tests indicate that 50 acres of oats can give 50 cows a grazing season for 50 days. Lester H. Smith, agronomist, and G. A. Williams, extension dairyman, say the oats pasture should be grazed

when the heads are just emerging from the boot.

Oats is a palatable and productive feed for cows, whether it is used as pasture or silage, these specialists say.

Wisconsin agronomists point out that getting the grain off the ground earlier give the new legume-grass seeding a better chance for growth. Oats compete for soil moisture, they say. Thus early harvesting of oats makes badly needed moisture available to the legumes.

Whether oats are profitable for pasture, silage, or grain, depends on the size of the yield, says the Midwest division of the National Plant Food Institute.

And the yield, in turn, depends on the soil's fertility level.

High-yielding, low cost oat crops come mostly from the use of plenty of fertilizer and other good management practices, says the Institute.

Midwestern agronomists list these suggestions for getting profitable yields: 1—Add lime to the soil, where needed; 2—Use approved seed varieties; 3—Apply fertilizer to provide well balanced supplies of nitrogen, phosphate and potash for the crop; 4—Use good tillage methods; 5—Control insects and diseases as much as possible.

Books on Pesticides

WEEDS—Second Edition (1955)

W. C. Muenscher

Entire book has been revised and reset, with descriptions of seventy weeds added to the original list of five hundred, plus twelve new full-page plates depicting nineteen kinds. Keys and full descriptions provided for identification with detailed illustrations of 331. Types and sources of weeds, their means of reproduction and dissemination, and the amount of damage they inflict on crops. Specific directions for control, with reference to chemical methods of recent discovery \$10.00

CHEMICAL BUSINESS HANDBOOK

Dr. John H. Perry

1,300 double column pages, the equivalent of several average books; 700 illustrations, by 124 contributors. Market research data section is 280 pages, business mathematics 200 pages, financial and accounting 142 pages, research and development 150 pages, sales and advertising 92 pages, twenty sections in all. The book deals with chemical management problems and is useful to technical men, engineers and executives, in the chemical and allied fields. Dr. Perry is editor of the Chemical Engineers Handbook, a companion publication \$17.00

INSECT PESTS OF FARM, GARDEN and ORCHARD Fifth Edition (1956)

Leonard M. Peairs and Ralph H. Davidson

A standard text for 44 years. Includes insects affecting grasses, grains, cotton, legumes, vegetables, flowers, fruits, stored products, household goods and domestic animals. Contains a new chapter on insecticide formulations, spray mixtures, application equipment, etc. Material on forty new pest species added, including drastic changes in the illustration. 661 pages \$8.50

DDT and NEWER PERSISTENT INSECTICIDES

T. F. West and G. A. Campbell

The first and major part of book is devoted to the physical and chemical properties, manufacture, formulation and applications of DDT. The second part deals with other chlorinated hydrocarbons whose insecticidal properties have been discovered recently and compares these new insecticides with DDT. The preparation of aqueous suspensions, solutions, emulsions, and dusts containing DDT, the compatibility of DDT with other insecticides, fungicides and additions are covered in detail. Contains dozens of tables on the solubility of DDT in various solvents, the catalytic activity of accessory substances in the presence of DDT, analogues of DDT, the comparative toxicity, hydrolysis and solubility of DDT analogues, the toxicity of DDT for almost all important insects, etc. Many illustrations \$8.50

APPLIED ENTOMOLOGY—Fifth Edition

H. T. Fernald and Harold H. Shepard

This text since 1921 has had an outstanding record of usefulness. The Fifth Edition preserves the general organization and coverage, with changes to improve the presentation and to incorporate new knowledge. Contains chapters on anatomy, physiology and development. The economic importance and control of insects are discussed in a general way with much attention to insecticides. The classification of insects is emphasized, with examples drawn from species conspicuous for being very harmful or decidedly beneficial. Specific control measures included for injurious forms. Last chapter considers other pest animals closely related to insects. 385 pages \$7.00

DISEASES OF FIELD CROPS—Second Edition (1956)

James G. Dickson, Professor Plant Pathology, University of Wisconsin

Covers the diseases of cereals, grasses, legumes and fiber plants, which are the major food, feed and fiber sources throughout the world. More than 60 diseases incited by viruses, 40 by bacteria and 300 by fungi are listed and discussed in relation to field crop plants. Identification and information basic to its control, with emphasis on the problems of crop rotation, adaptation and the use of disease resistant varieties. This revised edition includes several new diseases, new illustrations and much recent research in the field \$9.00

THE GARDENER'S BUG BOOK (1956)

Dr. Cynthia Westcott

The Complete Handbook of Garden Pests and their control. Information, scientifically accurate but easy to read on 1,100 insects, mites and other animal pests that attack trees, shrubs, vines, lawns, flowers, fruits and vegetables in home gardens. Illustrations in full color. Control measures combine the latest in chemical developments with time-honored cultural measures. Helpful to all who serve the general public and to truck farmers and fruit gardeners. 579 pages, cloth bound \$7.50

THE CHEMISTRY AND ACTION OF INSECTICIDES

Harold H. Shepard, Entomologist, U.S. Department of Agriculture, formerly Associate Professor of Insect Toxicology, Cornell University.

Treats the chemistry of insecticides, the history of their use, their commercial importance here and abroad, the nature of the major uses, the influence of environment on effectiveness. Materials are arranged according to their chemical relationships. Two chapters relating to organic compounds largely new as insecticides. Illustrative data in form of tables, and a convenient appendix of equivalents arranged for practical use in the field. 504 pages \$8.00

WEED CONTROL

W. W. Robbins, A. S. Crafts, and R. N. Raynor

A textbook-manual presenting a modern view of the rapidly developing field of chemical weed control. Reports in detail the research on which most modern herbicide usage is based. Weeds, their reproduction, prevention, biological control, chemicals in weed control. Herbicides, foliage contact applications, hormone-like substances, root applications, evaluations of combinations of chemical applications. Weeds of grasslands and turf. Special weed problems, cropped and uncropped areas. Published 1952. 503 pages, 155 illustrations \$8.50

INSECT, FUNGUS AND WEED CONTROL

Dr. E. R. de Ong

The information is grouped according to field of application rather than to chemical composition or nomenclature. Chapters on insecticide label, seed disinfectants, herbicides, forest insects and diseases, livestock insects, and the pests found in household and industry. Fumigation of warehouses, residual sprays and preservatives for fruits, vegetables and wood products are covered. An up-to-date guide on pest control with the needs of operators, agricultural and structural specialists carefully considered. Shippers and warehouse personnel will find the book useful \$10.00

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PROTECTING BUSINESS

(Continued from page 9)

order that unusual variations in these factors can be noticed promptly. Sales of scrap and waste to junk dealers and others have proved a lucrative source of funds for both the employee in charge and the dealer involved when controls over this material either were not followed or were inadequate.

BURGLARY: Once inside a building, a burglar has his choice of stealing finished goods, raw materials, or money. Since "hot" merchandise is worth only the amount of cash which a burglar can get for it and provides a problem of transportation and disposal, too, his usual preference is to steal money. Nevertheless, losses of merchandise and money resulting from successful burglaries are numerous—chiefly because of inadequate protection, and lack of attention to obvious safeguards which could have been provided.

A little care in reducing the likelihood of loss will go a long way toward reducing this crime potential in your business.

• **Insecure doors, unlocked windows, or unprotected skylights** are an open invitation for burglars to enter and steal. Where no easy entrance exists, one can usually be made if the prize is worth the effort. However, reasonable precautions plus the installation of some inexpensive devices are adequate for most plants. For others, the employment of watchmen and the use of alarm systems may be necessary.

• **Exterior doors with glass or thin plywood panels** are easily shattered or sprung. Locks which can be pulled, forced, or picked render an otherwise strong door useless. Hence exterior doors should be constructed to withstand assault with a pinchbar.

Locks on the door should be of the mortise deadlock variety with pintumbler cylinder locks, key operated from the outside.

If there is a possibility of someone hiding inside the building during business hours with the plan of breaking out later on, the locks should be key operated from the inside, too.

• **Windows** furnish thieves with their chief means of entrance. Glass can be easily and quietly broken, leaving the window lock exposed. Nevertheless, if the time and effort required to break through a window is measurably increased, the burglar may be forced to abandon his effort.

Windows that are accessible from the street or from roofs of adjoining buildings should, therefore, contain heavy wired glass and be securely locked from the inside.

Heavy wire screens or bars furnish additional protection for windows which are accessible on the sides or the rear of the building and not readily observed by policemen or passersby.

• **Skylights** are an excellent means of providing light, but they also admit thieves almost as readily. Since they are usually located on flat roofs, they cannot be observed by policemen or others at street level. Any noise made in breaking a skylight is reflected upward by the roof and is not apt to be heard. For these reasons, the panes should be of heavy wired glass and steel bars should be fastened underneath the skylight and across the ceiling opening.

Skylight windows should be kept locked. The wired glass and window locks will slow down an attempted entry. The bars should prevent a burglar from dropping through the opening to the floor below.

• **Floodlights** should be installed on the outside of the plant, well above the street level, so that areas immediately adjacent to the building

can be lighted during hours of darkness when your firm is closed. Burglars avoid well-lighted buildings.

• **Loading platforms** set into the building or located where they cannot readily be seen furnish burglars with ideal working areas. Consequently, well-constructed doors and locks are essential. These should be of heavy construction and locked from the inside. If the door slides up or to one side, there should be locks on both the left and right sides of the door.

• **Watchmen** provide a valuable service to every business interested in reducing its exposure to crime losses. To the small manufacturer, however, the main problem here is cost. One watchman may not be sufficient to provide protection at all times when the business is closed, including Saturdays, Sundays, and holidays. Consequently, two or more are often needed to afford adequate security.

Small businesses find it difficult, if not impossible, to justify such a recurring expense. Therefore, while watchmen are valuable in any plant protection system, other devices, such as an alarm system, should be considered if your funds available for premises protection are limited.

• **Burglar alarm systems** can give protection for all accessible openings, such as windows, doors, skylights, and partition walls. Other safeguards can be employed, but none of them will immediately detect an attempted entrance into the building and transmit an alarm to the local police authorities so well as a properly installed electric alarm system.

While an alarm system does create an expense for installation and service, you will probably find that one of the many different types of systems can be adapted to your business at a reasonable cost.

In many cases, it can be tied in with your fire detection system. In other cases, it may be sufficient to install a simple system protecting only a particular storeroom or stockroom. Furthermore, an approved burglar alarm system may reduce your insurance cost.

• **Police protection** is an obviously desirable service for the prevention and control of crime. All cities and towns have such protection in varying degrees, and the authorities are usually eager to provide all reasonable cooperation in safeguarding your building.

It is advisable to discuss with them your particular problems and your efforts to help yourself. But it is a mistake to rely upon the police for complete protection. Their services are spread thin, and with current expansion in plants, stores, and dwellings the police cannot always keep pace with needs.

Everything you do to safeguard your own premises makes the local police job easier and more effective.

• **Safes** designed to be fire resistive should not be relied upon to give burglar resistive protection. Fire resistive safes are usually no more than sheet metal shells filled with a fire-proof cement mixture. Their resistance to the efforts of even an amateur cracker is sadly inadequate. Pinchbars, hammers, and cold chisels are often more than sufficient to open them and remove the cash.

There are many different types of burglar resistive safes and chests designed both for everyday use, and for businesses with special problems.

Some have a moderate amount of burglar resistance while others are designed to provide a very high degree of resistance. Fire resistive safes containing burglar resistive chests are also available to provide both

SUMMARY

In designing any loss prevention program, the source of the losses is the starting point. While most losses are caused by accident, losses caused by dishonesty are due almost entirely to deliberate acts. Carelessness is important. But it is only a contributing factor. Consequently, preventive techniques have to cope with the many "angles" thought up by people bent on criminal activity. Some of these angles may be based on careless procedures by others.

The methods which small businesses use to reduce losses from dishonesty can be separated into three general groups: Prevention, reduction in the chances for success, and reduction in the amount of loss. The actual loss is serious enough by itself. But there are many additional costs of illegal acts which are often hidden and cannot accurately be measured. Some of these are: The expense of investigating and proving the loss, loss of destroyed or stolen records, loss of one or more trained employees, possible contamination of other employees which leads to new losses, cost of training replacement employees, loss of customers or customers' good will, unfavorable publicity and damage to prestige, lowered morale when suspicion is directed at honest and valued employees, financial difficulties and possible bankruptcy, and loss of market and anticipated profits.

The steps you, as a small business owner can take, are discussed in the accompanying article prepared for the Small Business Administration.

kinds of protection. In any case, the cost of a good safe is so little more than for an inferior type that it can largely be offset by the resulting reduction in insurance cost.

• **Safe installations** should be made where they can be easily observed by a guard or policeman. In addition they should be illuminated by an overhead light left burning when the premises are closed. Burglars tend to shun lighted areas under observation because of the greater risk of detection. If this procedure cannot be carried out in every instance, it should be followed wherever practicable.

Small safes should be installed in a concrete casing to prevent their removal from the building. Actually, of course, no safe or chest is absolutely burglar proof—if yeggs have enough time to work on it.

Sufficient time is usually not available when the safe is where it belongs. However, it can be removed, the burglars can blow it open at their leisure. A properly constructed concrete casing around a small safe will prevent this.

• **Safe combinations** should be changed at least once a year—oftener if custodians of the combinations change. Combinations should be committed to memory and a list of those employees furnished with each combination should be made. A combination lock is useless if the combination falls into the wrong hands or is written down on a wall, paper, or other object which is accessible to burglars.

• **Cash registers and cash drawers** should be left unlocked and open at the close of business. Money and checks should be removed and placed in a burglar resistive safe or deposited in a night depository.

Locked cash registers and cash drawers are open invitations to burglars. If they are unlocked and empty you may avoid both the loss of cash and damage to the container.

ROBBERY AND HOLDUP: Money is by far the most attractive target for robbers and holdup men. Sometimes furs, jewelry, and other expensive items are lucrative substitutes. But wherever money accumulates, there arises a magnetism which intensifies as the amount increases and its protection decreases. While the protection of large amounts of cash is sometimes woefully inadequate, the lack of safeguards for smaller amounts is even more pronounced.

It is almost as though the owners of some small businesses regard their own robbery exposure as insignificant and not worthy of reasonable protection. But there will always be small-time robbers as well as big-time crooks, and you should make their chances of success just as remote as possible.

• **Cash** should be deposited frequently as it accumulates so that no very large amounts will be exposed to loss at any one time. The hazard increases as the exposure increases.

• **Negotiable checks** received in the

normal business operations should be segregated from the money, immediately stamped "for deposit only," and microfilmed or listed with sufficient data to identify them. If such checks are segregated from the cash chances are that robbers will not take them.

However, if they are taken without having been stamped to render them useless to others or without your having recorded sufficient data to have replacement checks issued, your loss might just as well be in cash.

• **Safes** should be utilized during business hours to store, prior to deposit, any excess funds not immediately needed. The safe should be kept locked, and should be located in an area secluded from general traffic, but within vision of, say, the switchboard operator. Storing money in locked safes during the day means more delay to bandits and time is what they lack most.

Preventing the public from observing where your cash is kept makes it difficult for a robber to "case" the job.

• **Night depository safes** can frequently be utilized. Deposits often are prepared too late to reach the bank before it closes; similarly, cash may continue to come in after bank closing time. In such cases, it is necessary to keep the money in your own safe overnight, or deposit it in a night depository. The latter provides more protection and reduces the overnight exposure of the cash.

• **Payrolls** should be placed in a locked safe immediately upon delivery by your own messenger or an armored car service. Moreover, to make the timing of a robbery more difficult, this money should stay in the safe for some variable period of time. It should be at least half an hour. One week, for instance, it might be 35 minutes, another week 50 minutes, and a third week 42 minutes.

Cash payrolls present a prime robbery hazard because of their regularity of occurrence and ease of estimation. The element of surprise which holdup men count on is greatest just after the payroll is received; most successful payroll robberies occur at this time. As a result, securing the funds in a locked safe immediately upon receipt will minimize the chances of a successful robbery.

• **Messengers** going to the bank with deposits or returning from the bank with payroll or other funds should vary their route and time of departure as frequently as possible. Regular routine trips to and from the bank make it too easy for bandits to plan and carry out a successful holdup. Moreover, a guard or policeman should accompany the messenger to and from the bank whether he walks or rides. Here again, the presence of an armed guard or policeman serves as a deterrent to a hold-up and provides protection in the event that one is attempted.

Off-duty policemen are sometimes available for this service, which may

be arranged through local police authorities.

• **Remote areas** should be avoided on journeys to the bank and back, if possible. Areas where traffic is light and houses are few are ideal spots to commit a successful holdup. There is no point to increasing a bandit's chances of success nor inviting a holdup.

THEFT AND DISAPPEARANCE: Losses due to theft of raw materials, finished products, money and securities are occurring with ever increasing frequency. While the individual losses themselves are usually not large, their cumulative total is serious. The majority of these losses are a direct result of carelessness.

On the one hand, the fact that there is insurance for such losses sometimes leads to condonement of careless procedures. On the other hand, no insurance company is eager to cover such losses when their frequency suggests a disregard of sound business practice.

• **Finished goods** left on loading platforms are subject to pilferage by employees, truckmen, and others. Haphazard control of merchandise received or materials to be shipped provides an opportunity for such items to be stolen during handling with little fear of detection.

• **Tools, components, and new materials** are also common targets for theft and pilferage. Careful supervision and control of what is issued and returned each day are the best defenses. Whenever possible non-expendable tools and equipment should be numbered and assigned to workers by name; each item then can be checked back into the toolroom at the end of the shift. Similarly, excess materials and parts should be returned to stock and recorded.

• **Money** left, even momentarily, on top of desks, on counters, in open cash drawers, in unlocked desks, and other similar places is much too tempting an opportunity for sneak-thieves and employees of questionable honesty. It becomes easy to commit a theft, and avoid detection or divert suspicion to an innocent person. Everyone benefits, except the thief, when such careless practices are eliminated.

CHECKS: Approximately 90% of the business in the United States is customarily transacted by checks. This gives criminals extensive opportunities to forge and alter them.

• **Check forgery and alteration** are the easiest and safest forms of crime for skillful crooks. Checks may be stolen from business and residential mailboxes, from office mailrooms or cashiers' departments, and from the mails. Blank checks and cancelled checks with your signature can be filched from your office or home. These provide the forger with the basic material with which to work.

Checks may be altered by changing the serial number, the date, the payee's name, or the amount. Both signatures and endorsements may be forged, but the majority of losses result from forged signatures and endorsement in about equal proportions.

• **Checkbooks** should not be left exposed where blank checks may be misappropriated by employees or others, and should be kept under lock and key when not in use. This will limit the opportunity for a dishonest employee or other person to secure blank checks for forgery purposes.

• **Blank checks** should not be signed and left uncompleted as this is an open invitation for an employee to fill in fraudulently both payee and amount. In addition, if the checks are stolen in a burglary or robbery they would provide the criminal with an excellent method of increasing his loot.

• **Check-writing machines and safety paper** should be used whenever possible. Spaces between the dollar sign and first digit should be eliminated.



Doing Business With

Oscar & Pat



By AL P. NELSON
Croplife Special Writer

Into the Schoenfeld & McGillicuddy store came three people, burly Clarence Stubbs, his wife Midge and son Elmer, age 13. Traditionally Clarence, the father, walked in first, followed meekly by his wife, and the son Elmer brought up the rear. In this family the father was the spokesman. He was a breed that is fast disappearing in many rural sections. In fact, the whole Stubbs family could have been the subject of a Grant Wood's Iowa farmer painting, typical of 1920 to 1940.

"Where is that Pat?" asked Stubbs of Oscar. "I want to talk to him about some fall fertilizer."

"Ach, he is runnink aroundt someplace as usual," Oscar said irritably, looking up from his desk. "If he would stick to his desk and get something done like I do, it wouldt be wonderful."

"Every man to his last," chuckled Stubbs. "And the good Lord will judge him when he gets his shoes made. Hey, there's Pat now!"

As the tall partner came into the room, he greeted Stubbs and family, with a smile. "Hello, hello," he said. "Mighty glad to see you folks. Come in and visit for awhile. I'll get a couple of extra chairs." He held the gate open to the enclosure behind which was his desk and Oscar's.

"No, Ma and Elmer's got a little business to do at the stores," said Stubbs quickly. "I want to talk to you about fall fertilization. I got that letter you wrote. And if you kin talk to me now, Ma and Elmer can go about their business."

"I always have time for a customer," smiled Pat. "Sit down."

Stubbs turned to his solemn faced wife and boy. "Now Ma," he said slowly. "You and Elmer take the car and try to sell the sweet corn at the grocery stores. Remember, tell them it's been fertilized with Oscar & Pat's best fertilizer, and that it's been side dressed, and sprayed for sweet corn worms. It's the very best. Get the highest price you can."

"Yes, Pa."

"And if there's any corn left over, then you go to the restaurants in town. Try to sell the corn for cash, but if you can't do it, ask them if they'll give the three of us a meal this noon for it."

"Yes, Pa."

As the wife and son trudged obediently out of the sales room, Oscar looked up and surveyed Clarence Stubbs as he sat at Pat's desk. He felt admiration rising within him. Now here was an economical man.

He was not one to waste anything. He made use of everything he had and had taught his family to do the same thing. That man would get ahead, Oscar reasoned, ahead money-wise.

"Now, Pat," said Stubbs matter of factly, "you sent this letter saying you'd give 3% discount for fall plow-down of pasture fertilizer, if it was paid in cash, and that we should come in for a conference on how it would save us money."

"That's right," answered Pat in a friendly tone.

"Well," said Stubbs, "I can see where the 3% discount would offset the 3% savings account interest I'd get at the bank. But what other benefits are there? If I wait until spring, the price of fertilizer might get lower."

"It could," Pat agreed, "but I

doubt it. If you buy and spread fertilizer now, you gain in a number of ways. Plowdown fertilizer starts working for you now and then as soon as the ground thaws in spring. If we have a wet spring—like Illinois farmers had last spring, for example—you might not be able to get fertilizer spread until late. There might be a rush, labor costs would get high, and you might get green fertilizer which would not be fully cured. That could affect your crop yield."

"I know that," replied Stubbs, "but it's a chance I could take."

"Sure, but remember you are always so busy in spring. Days aren't long enough. Get the fertilizer in this fall and that's one less chore you have to worry about."

"But I could leave my money in the bank till spring, then buy fertilizer and still get a 3% discount."

"Perhaps, but you run the risk of higher labor costs, wet spring and green fertilizer, too. And when you figure that you can get about \$3 for every \$1 you invest in fertilizer, why take a chance that under unfavorable spring conditions you might get only \$2 for every \$1 invested? The loss would be great."

Clarence Stubbs nodded. "Maybe a farmer should take such a risk. And pasture fertilization. What good would that do now at the end of the season?"

Pat turned to a filing case, opened it, drew out a folder. "I may not keep my desk too neat, but I do keep up this file," he smiled, casting a quick look at Oscar. "This is a pasture fertilization record of Jim Gasper. He's been fall fertilizing on pastures for three years. He's got lush grass right to the middle of November. And he gets a lot of extra milk from his cows. In fact he tells me he pays for the fertilizer and has an extra profit besides."

"Hm," said Stubbs, as he perused the record sheet.

"Gasper's only a 15-min. ride," Pat suggested. "Let's go out and take a quick look at his fine pasture now. If your wife and boy come back they won't mind waiting here a few minutes."

"Okay," agreed Stubbs. "I really want to get the facts on this fall fertilization. I don't want to throw my money away."

A half hour later when the men returned it was 11:45 a.m. Solemn faced Mrs. Stubbs and her son sat near Pat's desk.

"Pa," said the wife anxiously, "we sold all but four dozen. The restaurants wouldn't take none for meals. Only the Tiny Cafe bought two dozen for cash, and the stores took the rest."

"Hm," said Stubbs solemnly. "Times must be hard. What we gonna do with them extra four dozen? We better go home and eat instead of restaurantin' out, Ma."

"I'll buy those four dozen ears," Pat said quickly. "I've some kids and they love corn. And I know Nora's got a big kettle of corn beef and cabbage. Come on and have lunch with us. I'll give her a call now. She likes company. What do you say?"

Stubbs looked at his sober faced wife, and saw her nod. A free meal anywhere was nothing to be passed up. So while Pat phoned and got an enthusiastic okay from cooperative Nora, Clarence Stubbs was already thinking how nice it would be to lie in

bed on long winter nights, knowing that plenty of rich fertilizer was lying deep in his soil, waiting only for spring to send corn and hay and alfalfa shooting upward to make new and sensational yields.

ALLIED LINES

(Continued from page 12)

There are many branches of the city, county, state and federal government. You are personally paying for the city, county, state and federal governments and you are not asking anyone a favor other than yourself when you ask for assistance. At a recent garden clinic, we had the head of the state department of entomology, and a department head of the state university, both of whom added much to the clinic.

GROWERS AND MANUFACTURERS: Growers and manufacturers are all interested in promoting the sale of their materials. For that reason, if for no other—and frankly there are many others—they are delighted to assist in promotions of various kinds if they are worthwhile.

WHOSE PROMOTION IS IT? We think this is of tremendous importance. Whose garden center is it? Don't let somebody else run your promotion. If you are going to have a really good promotion and attract hundreds of people (if not thousands of people) to come to it, be sure you get credit for it. In other words—and to go back to the Garden Clinic again—I think it would be a serious mistake to arrange it in such a way that some else gets full credit for putting it on. However, if you use a combination of your own authorities, plus manufacturers' or growers' authorities, you can end up sitting in the driver's seat and it is your promotion.

DESCRIPTIONS OF PROMOTIONS: Here are six promotions and only one point under each of these promotions will be discussed to illustrate some particular point involved.

AFRICAN VIOLET SHOW: One of the best promotions that we ever had was an African violet show held 10 or 12 years ago. We found a grower who was an authority on African violets. In addition, we had another authority. However, the time was the important factor, and this was a question of judgment, and we thought the time was right for an African violet show. We had people lined up to look at the African violets, we had traffic tied up for blocks around (this was at a downtown store) and from early morning until late afternoon the mobs came.

A year later we tried another one and it was only fairly successful. It's a question of timing.

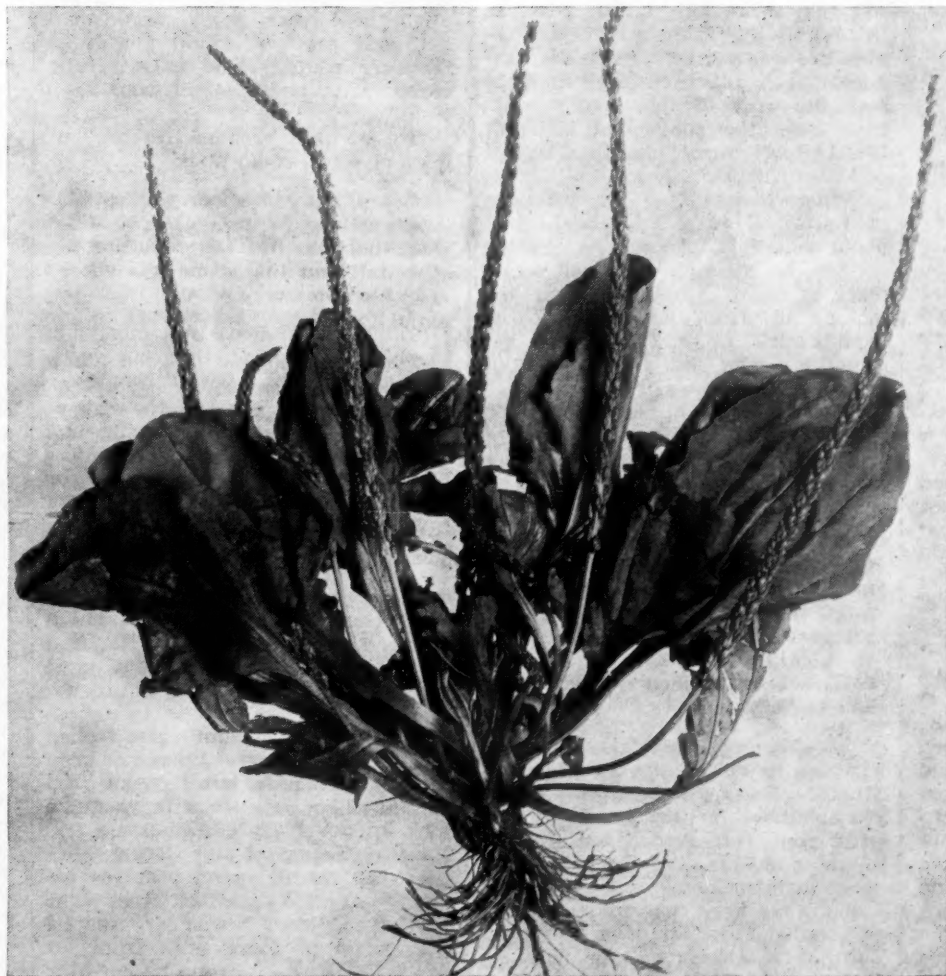
GARDEN CLINICS: The most important point here is to have really fine authorities. We have had a garden clinic to discuss insects and diseases for several years and in this instance we think that the really important point is to have authorities that are really fine. A by-product of the garden clinic is the education of our own people.

GARDEN CLUB MEETINGS: Here, we think the point at issue is the fact that the clubs are usually small and that to talk to one of them requires a half day's time. Therefore, the important point is convenience, and as mentioned previously, we do this sort of work in our own place, and then whoever of our own talent

(Turn to ALLIED LINES, page 21)

WEED OF THE WEEK

Mr. Dealer—Cut out this page for your bulletin board



Broad-Leaved Plantain

(*Plantago rugelii*)

How to Identify

This plant, appearing in turf and areas other than cultivated land, is a perennial, reproducing by seed. It is found in yards, pastures, lawns, and waste places. Its leaves grow close to the ground and the flowering stalk may extend upright from 3 to 6 inches. Leaves are oval-shaped, measuring from 1 to 8 inches in length, and have smooth margins. Seeds are shiny, light to dark brown in color, irregular in shape and have a scar on one side. Each plant is capable of producing a large number of seeds. In addition to being called "Broad-Leaved Plantain," the weed is also known as Rugel's plantain, Major plantain, dooryard plantain, English plantain and common plantain.

Characteristics of Plantain

As noted earlier, plantain is a perennial, reproducing only from seeds. The seeds

are contained in a nearly cylindrical seedpod which is about 3/16" long, splitting across the lower half and containing numerous seeds. This arrangement permits the dropping of seeds to the ground, where they germinate and start a new generation of plantain. The plant flowers June to September and seeds July to October.

Damage Done by Plantain

When it appears in a lawn, the plant tends to crowd out grass by spreading its leaves on the ground. It is difficult to keep under control, particularly since ordinary mowing fails to kill it. Some sources recommend digging the plants with some type of knife-like instrument if the infestation is light. However, the application of 2,4-D and other selective herbicides has been effective in controlling the plantain.

Illustration of Broad-Leaved Plantain through courtesy of U.S. Department of Agriculture.

CHANGE PATTERNS

(Continued from page 3)

the present day nitrogen industry was provided early during the World War II period. This was accomplished by the government's building ten large synthetic ammonia plants with a total capacity of about 800,000 tons nitrogen. By late 1942, it was evident that not all of the nitrogen produced by the industry and government plants, would be needed for explosives or other military uses. At the same time, the need for fertilizer nitrogen to increase food production became increasingly acute. Hence, the TVA plant was released for the production of fertilizer grade ammonium nitrate, and private companies also decided to initiate the production of fertilizer grade ammonium nitrate. The new nitrogen industry was thus launched in the United States.

In fiscal year 1943 there were two producers of solid fertilizer grade ammonium nitrate in the United States—the TVA plant at Muscle Shoals, Ala., and Hercules Powder Co. at Pinole, Cal. During this year, about 18,000 tons ammonium nitrate fertilizer were used, of which TVA produced 75%. By 1957, American farmers were using over 1,000,000 tons of ammonium nitrate as a straight material for direct application on crops. Approximately twenty plants with a capacity estimated to be well over 1,500,000 tons of solid fertilizer grade ammonium nitrate are currently in operation.

Another important product and one which has had a powerful influence on market structure in the fertilizer industry of today is anhydrous ammonia, the initial and most concentrated nitrogen product from the synthetic process.⁶

In 1943 there were 17 anhydrous ammonia plants in the United States, including eight government plants which had been constructed at that time. The total number has now been increased to over 60, with large expansions in capacity, installed at most of the original locations. Capacity for production at these plants is not known precisely, but it is estimated to be over 4,000,000 tons of nitrogen annually, which includes that available for industrial use. This represents a ten-fold increase in productive capacity since 1940 and a five-fold increase since 1943.

There have been and continue to be marked changes in the forms of nitrogen fertilizer available for use on farms. The use of solid ammonium nitrate as a straight fertilizer material has increased to over 1,000,000 tons annually. Anhydrous ammonia, liquid ammonium nitrate solutions, and various other liquid nitrogen solutions are receiving increased attention and use.

Very high analysis materials, such as diammonium phosphate containing 21 units of nitrogen and 53 units of available phosphorus pentoxide, are becoming increasingly available. And on the horizon is a whole series of mixtures of nitrogen and phosphoric acid, both solids and liquids, which may soon flow through the marketing channels and be used in complete mixtures and also directly on American farms.

The nitrogen industry since World War II has expanded noticeably, not only as to capacity and production, but also as to diversity of products and as to larger numbers of companies in the business. This has re-

sulted in increased competition in the nitrogen segment of the fertilizer industry. Instead of having a "big Four," there are now at least 17 major producers of synthetic nitrogen products and these are widely distributed throughout the United States. Most of these companies are primarily chemical or petrochemical companies. Technical advances, low cost government surplus plants, rapid depletion allowances, opportunities for diversification, and the development of an expanding fertilizer market all have played their part in bringing many of these into the industry.

The nitrogen industry of today in the United States is both new and expanding. For the most part, the industry has grown out of the technological changes developed during World War II and the encouragement to expansion given by the government. The shortage of labor during the war, improvements in farm machinery, recognition by farmers that they must become more efficient in production, the lowered costs of fertilizers relative to other factors of production, and more knowledge among farmers of how nitrogen applications bring a quick return on investment, all increased demand for fertilizer. These conditions still exist to some degree.

The Phosphate Industry

In contrast to the synthetic nitrogen industry, the phosphate industry of the United States is much older. Due largely to limited areas of suitable phosphate minerals which are owned or controlled by a limited number of firms, the competitive aspects of the industry are quite stable. Recent estimates indicate that of the total United States phosphate reserves in the three areas in which economical production can be achieved, 38% is located in Florida, 61% in the western fields of Utah and Idaho, and 1% is located in Tennessee. However, the location and percentage of reserves are not a significant indicator of quantities produced in the various fields. At present, three-fourths of the phosphate rock mined in this country comes from the Florida fields, and about equal amounts of the remaining 25% from the western and Tennessee fields.

The western fields were not tapped extensively until the late 1940's, although the presence of these reserves had been recognized for a long time. In 1934, only 1% of the rock mined came from the western fields and in 1946 only 7% came from there, yet by 1957 13% of all rock mined came from the western fields.

There are some indications that two TVA developments in the field of phosphorus may accelerate the production of phosphatic fertilizers from western deposits. These are (1) the development and wide-scale introduction of calcium metaphosphate containing 62 to 64% phosphorus pentoxide, and (2) the more recent development of superphosphoric acid, containing approximately 50% more phosphorus pentoxide than the normal commercial product.

At least one new plant is under construction in the western area to utilize these developments. The high concentration of plant nutrients in these products makes it economically feasible to ship them over a wide area from the point of production.

During the seventy years prior to 1930, some 200 phosphate fertilizer plants had been built with an annual capacity of about 1,600,000 tons of available phosphorus pentoxide equivalent. These facilities were used at less than one-half capacity. The principal product de-

veloped for fertilizer was ordinary superphosphate containing up to 20% of available phosphorus pentoxide. By the late twenties, five concentrated superphosphate plants were constructed by private industry which permitted the production of a 45% available phosphorus pentoxide product. However, very little of this product was sold to farmers either as a straight fertilizer material or in mixtures.

Concurrently, the industry is increasing its production of concentrated superphosphate. Ordinary superphosphate still occupies an important place, having doubled production to over 1,500,000 tons of available phosphorus pentoxide since 1930. During the same period, its production capacity has also approximately doubled.

The primary phosphate material showing the most marked increase in production is concentrated superphosphate. From an annual production and use of approximately 30,000 tons in 1934 its use had increased to over 750,000 tons available phosphorus pentoxide in 1957. A large potential increase in the production of this material exists in the western fields, where several companies are in the process of increasing their capacity for production.

Another technological change which has developed in the phosphate industry perhaps as a direct result of changes in the nitrogen industry is the production of ammonium phosphates. Production of these materials (primarily 16-20-0, 11-48-0, and 13-39-0), and later diammonium phosphate (21-53-0) actually began on a commercial scale in the late '40's. Prior to that time, very small quantities had been produced in the U.S., and some small quantities had been imported, but the ammonium phosphates as such had not been popular. As late as 1946, only about 50,000 tons of these materials were being used as straight materials in American agriculture, and these almost entirely on the West Coast.

By 1957, almost 400,000 tons of these materials were used as straight materials for direct application, and farmers, except in the traditional old fertilizer use areas of the Atlantic Coast and the Southeast, were becoming familiar with them. The advantages—high analysis, high water solubility, and chemical combinations of nutrients—promise a larger trend to their use. Some of these materials such as diammonium phosphate are completely water soluble; and offer promise of being ideal for use in the changing trend toward liquid mixed fertilizers.

Another change is the trend toward use of liquid phosphoric acid as a straight fertilizer material (on the West Coast primarily), or as liquid mixed fertilizer. Prior to recent technological advances in the manufacturing process, both by the wet process and in the electric furnace method, the cost of this liquid phosphoric acid was prohibitive for use as a fertilizer agent. Yet, recent advances and the increased supply give it promise to supplement the very low cost nitrogen solutions. Until 1949 it had been used as a straight fertilizer material only in Arizona and California, and less than 6,000 tons had been used in any one year. By 1957 its use had tripled to over 18,000 tons and, with increased supplies becoming available, it may continue to increase in the future.

Another factor which promises to result in a greater use of liquid phosphoric acid is the development by TVA of the superphosphoric acid, equivalent to 105% phosphoric acid in terms of P_2O_5 . If favorable freight rates are established on this type of material, another step forward will have been taken in aiding farmers to obtain better fertilizers more economical-

ly. In addition to being highly concentrated, this material offers some promise of helping the liquid mixers in their technical problems of mixing liquids which do not "salt out," "gel," or form precipitates which clog spreading equipment.

Many changes have been wrought in the phosphate industry since the 1930's. Prior to the mid-thirties, it had grown to maturity as an industry of normal superphosphate producers. Since the late thirties, the industry has changed rapidly. New types of phosphatic fertilizers are being produced and the industry has expanded. At the same time, farmers have profited from the more economical forms of phosphatic fertilizers.

The Potash Industry

The potash industry, as it exists today, has existed only since the beginning of World War II. Progress, however, has been quite different as compared to the other two primary components of the fertilizer industry with respect to the entrance of new firms, and technological improvements in the development of new products. There has been much progress, however, in mining efficiencies and refining methods.

The increase in size of the industry has been primarily in the size and scope of the operations of various companies in the industry. Few new companies have entered the field. There were seven producing plants in 1939, but by 1953 there were ten plants producing almost two million tons K_2O compared with slightly over 300,000 tons in 1939. Prior to 1939, practically all potash used in America was either imported or byproduct material.

In World War I and immediately thereafter an abortive effort had been made to begin the American potash industry; but, during the early twenties active efforts to start the industry were discontinued. However, research continued and exploration for deposits which could be economically mined was expanded. Deposits were located in California, New Mexico, Utah, and Saskatoon, Canada. New mining and refining methods now make it profitable to mine potash rather than import it. With known deposits, the United States will not soon again be dependent upon imports.

The known annual capacity of these mines is now well over two million tons and can rapidly be expanded if the need arises. At the same time that capacity has been rapidly expanded, the price of the material had held relatively constant until recently. During the past year wholesale prices of muriate of potash have declined to a point where the cost of potash per unit of plant nutrient is at one of the lowest levels of all time.

The potash industry has also grown rapidly—perhaps more rapidly than either the nitrogen or phosphate industries; but the nature of the growth has been quite different. It was a growth based on the leasing of government lands by a few large companies having the capital necessary to invest in such large mining enterprises.

The Mixing Industry

To a large extent farmers have used mixtures of nitrogen, phosphorus, and potassium. In some cases only two of the so-called primary nutrients constitute a mixture. The content of nutrients including chemically combined carriers plus fillers and conditioners to bring the materials "up to weight" constitutes mixed fertilizers.

Prior to the use of soil tests, and still to a marked degree, specific grades or ratios tend to be used by farmers in an area for specific crops or pastures. Hence, a mixer is able to prepare in large quantities the

6. Anhydrous ammonia is a gas at ordinary pressures and is the only gaseous fertilizer used as such in mixed fertilizer operations and for direct application to the soil. It is stored and transported under pressures sufficient to condense it to a liquid state. It contains 82% nitrogen.

various grades that generally will be demanded in his market area.

The development of the TVA continuous ammoniator enables production of mixed fertilizers with a higher proportion of low cost liquid nitrogen than formerly, thus lowering the cost of mixed fertilizers.

The ammoniator has contributed further to the mixing industry by permitting continuous rather than batch production. It also provides the means for widespread development of improved granulation of materials and mixtures.

Primary producers of potash and synthetic nitrogen have effected integration into the mixing industry to a much smaller degree than have the phosphate producers. However, there is a recent trend toward integration between nitrogen producers and fertilizer mixers. There are also indications of barter arrangements between primary producers so that such might obtain supplies of the primary plant nutrient they do not produce.

Fertilizer mixing plants tend to be located near the markets they serve. Mixing usually involves a weight gaining process employing some low cost ingredient often available locally. Mixing plants producing dry mixes in the period prior to World War II usually marketed 70% of their products within a radius of 50 miles of the plant.⁷ Now, however, increased efficiency and the production of higher analysis mixes permit larger areas of distribution. Recent innovations in the use of multiple hopper spreading equipment and bulk-blending techniques which eliminate the necessity of the added weight of fillers and problems inherent in mixing may, however, reduce the trend to larger mixing plants.

Use Changes on Farms

Many agricultural areas have only recently realized opportunities available to increase income through the use of fertilizer. This increase in the demand for fertilizer has resulted from a large number of conditions and improvements in other factors of production, as well as fertilizer. By considering the factors governing demand separately we can see how each has contributed to the continuing expansion of fertilizer use.

During World War II farmers produced unprecedented amounts of food and fiber to support the war effort. As a result, there was a large drawdown in the fertility reservoir. Improved plant varieties, herbicides, and pesticides were developed after the war. These conditions set the stage for increased demand for fertilizer not only in old use areas, but also in many areas which had never used fertilizer.

The improvements in other chemicals used on farms are continuing as are plant variety improvements. Their combined use with fertilizer gives results which would not be possible if any of them were used without the others.

The government's acreage control program without restrictive use on other factors of production also contributes to increased demand for fertilizer. In addition, certain ACP payments have been made to farmers on a direct reimbursement basis for fertilizer purchased for some crops.

More farmers are fertilizing more crops, using higher rates of application. The trend has been toward more fertilizers on hay, pasture and cover crops. Yet there remains a tremendous acreage of these crops which is not fertilized, and most of the fertilized acres receive very small amounts in comparison to college recommendations.

One of the more important factors contributing to expanded use of fertilizers over the past few years, espe-

7. Lister, John H.—Cooperative Manufacture and Distribution of Fertilizer by Small Regional Dry-Mix Plants, USDA Circular No. C-126, June, 1941.

| TABLE I | | | | | | | | | | |
|---|----------------|--------------------|-------------------|--------------------------|--------------------------|--------------------------|--------------------------|---------------|---------|---------------------------|
| Percentage Change in Fertilizer Consumption, by Regions, 1946 ^a to 1957 ^b | | | | | | | | | | |
| (Years ending June 30) | | | | | | | | | | |
| Regions of United States | | | | | | | | | | |
| | New England | Middle Atlantic | South Atlantic | East North Central | West North Central | East South Central | West South Central | Moun- tain | Pacific | Total United States |
| (Percentage of Increase or Decrease) | | | | | | | | | | |
| Consumption of total primary plant nutrients | - 6.1 | +33.7 | +34.2 | +165.3 | + 394.0 | + 70.4 | +156.0 | +248.6 | +113.1 | + 94.8 |
| Nitrogen consumption | + 7.7 | +81.0 | +71.0 | +416.2 | +1591.4 | +125.7 | +277.6 | +647.9 | +176.3 | +185.3 |
| Phosphate consumption | - 9.3 | + 5.2 | + 5.8 | +142.1 | +263.9 | + 16.8 | + 83.2 | +115.0 | + 44.7 | + 59.5 |
| Potash consumption | - 5.7 | +76.4 | +68.3 | +224.1 | + 466.6 | +168.2 | +165.9 | +159.2 | + 49.0 | +130.0 |
| Average analysis of all fertilizers | +14.5 | +22.0 | +25.2 | + 55.9 | + 63.9 | + 37.3 | + 71.6 | + 43.2 | + 68.2 | + 45.1 |

a. Mehring, A. L., Adams, J.R., and Jacob, K.D., Statistics on Fertilizers and Liming Materials, USDA Statistical Bulletin No. 191, ARS, April 1957.

b. Scholl, W., Davis, M. M., and Crammatle, F.B., Consumption of Commercial Fertilizers and Primary Plant Nutrients in the U.S., ARS, 41-19-1, June 1958.

cially on soil conserving crops, has been the bringing together of fertilizer manufacturers, distributors and dealers, with the public agricultural agencies, in developing educational programs involving manufacture, distribution, and use of fertilizers. This has tended to help the group to identify problems facing the fertilizer industry and farmers, and more specifically to develop unified action programs.

The price of fertilizer has increased less relatively than most of the other inputs farmers use. The Department of Agriculture has estimated that while the cost of all fertilizers, based on 1935-39 prices, increased 48%, feed prices increased 100%, farm machinery, 116%, and wage rates, 346%.⁸ It appears, therefore, that one of the principal reasons for the increased demand for fertilizer has been its relative improvement, from the farmer's viewpoint, as a cost of production item.

In the past, much of the mixing, wholesaling and retailing was on a high volume, low margin basis. Increased use in many agricultural areas and the improved storing condition of fertilizer materials may tend to intensify this situation. The economies inherent in operating large mixing plants and of distribution in intensive use areas may result in fewer handlers, each doing more business than at present. This should assist in further lowering costs of fertilizers to farmers. Improved methods of handling, such as in bulk or in liquid and gaseous forms, will also contribute to this general improvement in the economies of distribution.

One innovation with great potential is the soil test. As a result of its use many more ratios of plant nutrients than are now available may be needed in a mixing plant's marketing area. Several marketing schemes are now being employed in various locations to meet this new demand.

Fundamentally, each method depends on the use of straight materials mixed in the local area to the ratio prescribed by the soil test. Three methods used are bulk-blending (including prescription mixing), multiple hopper fertilizer spreader use, and liquid mixing. Each of these new marketing techniques reduces the cost of mixing, and makes it less necessary to use additives.

A central feature of these innovations in fertilizer marketing is custom spreading. Application machines designed to handle three straight materials simultaneously cost more, so there are usually not enough of them available on single farms to secure

efficient cost of operation.⁹ In addition, studies in some areas of the Midwest have shown that farmers dislike handling and spreading fertilizer. In Illinois where bulk-blending is now being done in 92 small plants, 27% of the total straight materials was handled by these mixers during 1956.¹⁰ Rapid growth in bulk blending has developed in Illinois and in other areas of the Midwest.

If this segment of the industry continues to grow, a great decentralization of mixing operations could occur. With such a development, market structure might be altered considerably with perhaps an improved ability on the part of industry to meet the specific plant nutrient needs of each field on each farm. If this activity is to expand significantly, it may have to overcome some important problems such as securing and maintaining uniform mixtures, and modifying the present seasonal demand for the spreading service.

Research Programs

Another innovation which indirectly affects changes in market structure is the improved knowledge of economical fertilizer use through research. During the last decade marked improvements in agronomic research relative to fertilizer use and economic interpretation of the agronomic data have been made.¹¹ Now, instead of investigating the effects of single plant nutrient increases or decreases on crop production, researchers design their experiments so that various combinations of applied plant nutrients are tested simultaneously. The relationships among plant nutrients may be thus determined, and the best combinations and application rates may be found. Findings from these studies have armed agricultural workers, fertilizer company fieldmen, and others with the basis for making better recommendations based on economic factors. These developments and others are focusing farmers' attention on the price of plant nutrients to a greater extent than formerly.

Linear programming is another research technique which is demonstrating to agricultural workers the role that fertilizer can play in farm organizational structure.¹² Increased use of this technique by researchers and agricultural workers should eventually contribute to a more stable

and increasing demand for fertilizer in most agricultural areas.

The authors have attempted to indicate and explain briefly some of the major changes in the fertilizer industry and in the demand for the last three decades. It is our hope that more research workers will undertake studies of specific problems related to the fertilizer marketing structure with the objectives of (1) securing a better understanding of this industry, and (2) determining efficiencies in the marketing system to help farmers to secure plant nutrients at lower costs per unit, and yet maintain a strong and expanding fertilizer industry.

Forest Fertilization School Scheduled

PACK, WASH.—The University of Washington will hold a special school at its forest field research center, here, Thursday and Friday, Sept. 4 and 5. Area agronomists have been invited for the purpose of getting acquainted with the problems of forest fertilization in the Pacific Northwest.

Included among topics to be discussed will be "What is Forestry?", "Concepts of Forest Management," "Forest Physiology Problems," "Operations of a Tree Farm," "Forest Soil Problems," "Forest Tree Nutrition," "Forest Fertilizers," "Forest Regeneration," "Forest Measurements," and "Aircraft in Forestry."

Featured speakers will include Drs. S. P. Gessel, R. B. Walker and Ken Turnbull, University of Washington; Dr. T. N. Stoate, chief forester, McMillan and Bloedel; Dr. Warren Starr, soil scientist, Washington State College; Dr. Chet Youngberg, Oregon State College; Dr. Gene Steinbrenner, Forest Research, Weyerhaeuser Timber Co.; Ray Austin, forester, Crown Zellerbach Corp.; Ted Yocum, chief forester, Simpson Timber Co.; James Trappe, Pacific Northwest Forest Tree experiment station; George Schroeder, chief forester, Crown Zellerbach Corp.; Carl Hupman, resident manager, Pack Forest, and Ted Wadley, Mora Chemical Co.

Pack Forest, site of the meeting, is located on highway 5 midway between Tacoma and Mt. Rainier National Park, approximately 1 hour's drive from Seattle-Tacoma airport.

F. T. "Todd" Tremblay, National Plant Food Institute, Seattle, is in charge of arrangements.

SHORT COURSE PLANNED

ST. PAUL, MINN.—The annual soils and fertilizer short course will be held at the University of Minnesota, Institute of Agriculture, in Coffey Hall beginning at 9 a.m., Monday, Dec. 8, 1958, according to an announcement by Dr. Wm. P. Martin, head of the department of soils.

9. Harold G. Walkup—Economic Considerations in the Use of 3-Hopper Fertilizer Spreaders in Kentucky, Knoxville, Tennessee Valley Authority (in press).

10. B. J. Bond and Earl R. Swanson—A Cost Analysis of Fertilizer Bulk-Blending Plants, The University of Illinois in Cooperation with TVA (in press).

11. E. L. Baum, Earl O. Heady and John Blackmore—Methodological Procedures in the Economic Analysis of Fertilizer Use Data, Iowa State College Press, 1955.

12. E. L. Baum, Earl O. Heady, John T. Pesek and Clifford Hildreth—Economic and Technical Analysis of Fertilizer Innovations and Resource Use, Iowa State College Press, 1956, Part IV, pages 243-316.

8. Computed from The Farm Cost Situation, USDA, November, 1957.

Fall Fertilization Urged By NPF Executive In Recent Address

WASHINGTON — Farmers who fertilize their grasslands and legumes now, rather than wait until spring, can increase their net profits from forage as much as 200%, Dr. Russell Coleman, executive vice president of the National Plant Food Institute, said recently.

"The increased profits from fall applications of fertilizer on grasses and legumes result from utilization of labor during the slack time following harvest and the extension of the grazing period for livestock," Dr. Coleman explained.

He said, "There are other economic advantages from fall fertilization" such as:

1. Savings on feed bills; 2. More luscious growth of grass in the following spring, at least three weeks earlier; 3. Greater conservation of soil structure by avoiding compaction caused by heavy farm machinery.

Dr. Coleman urged farmers to follow the recommendations of their experiment stations as to rates and grades of fertilizers to use in the fall.

"Generally, across the U.S., farmers should have no fears of nitrogen losses on grasslands due to leaching resulting from fall and winter rains," he said, "with the possible exception of sandy soils."

"There is economy in maintaining established pastures and hay lands rather than undergo a rejuvenation program every spring," he added. "Fall fertilization, in keeping with land-grant college recommendations, is another way farmers can beat the price-cost squeeze and reduce the per unit cost of production."

Fertilizer Industry Contributes to 4-H Fund

WASHINGTON—Thirty five companies had contributed to the work of the National 4-H Club Foundation as of mid-August, in response to an invitation from Richard E. Bennett, president of Farm Fertilizers, Inc., Omaha, Neb., and president of the National Plant Food Institute. Mr. Bennett is serving as fertilizer industry chairman for a fund raising program in behalf of the 4-H Foundation. The program was begun in June and continued through August.

In a mid-August follow-up letter

to the fertilizer industry, Mr. Bennett said, "I have been pleased with the response from my personal appeal to the entire fertilizer industry. I want to close the program this month and it is my desire that every company in our industry will be represented on the published list of donors. As I pointed out in my original letter, this program is not only most worthwhile, but is of significant value in expanding the over-all public relations of our industry. . . ."

Ammonia Fumigant Tested For Peach Rot Problem

RIVERSIDE, CAL. — A disease-control technique developed for citrus may prove effective on a major peach industry problem, University of California scientists believe.

Effective control of Rhizopus rot on peaches can probably be obtained by ammonia gas fumigations similar to those used in preventing certain diseases on citrus fruits, experiments on the Riverside campus indicate.

I. L. Eaks, J. W. Eckert and C. N. Roistacher of the departments of plant biochemistry and pathology obtained good control of the rot on peaches by two six-hour fumigations with ammonia at about 250 parts per million in concentration. No fruit injury was apparent, they reported.

With severe inoculations of the rot under experimental conditions, they found high dosages were necessary. Slight fruit injury resulted.

Extensive field testing and statistical evaluation will be needed before commercial applications of these preliminary results can be made, the Riverside scientists remind.

Sulfur Production Down in June, 1958

WASHINGTON — Some 383,664 long tons of native sulfur were produced domestically in the U.S. during the month of June, 1958, according to figures just released by the U.S. Department of the Interior. In addition, the industry produced 48,039 tons of recovered sulfur. Producers' stocks of native sulfur increased slightly over the previous month, and at the end of June, totaled 4,661,649 tons, the report says.

The June, 1958, production was less than that of the same month last year for native sulfur and sales, likewise, were down. Apparent sales for June, 1958, were 342,362 tons as compared to 445,671 tons for June last year.

Southern Farmers Busy Keeping Ahead of Boll Weevil, Other Bugs at Harvest Time

MEMPHIS — Insect control, harvesting of crops and the beginning of preparations for fall crops are the main items on the agenda of many farmers in the Mid-South at this time.

County agents of the Mississippi extension service reported insect control as one of the major jobs occupying farmers at the present. Boll weevil numbers are increasing in many parts of the state, and local migration was reported.

Grover C. Dowell, Arkansas extension entomologist, in a report the middle of August stated that boll weevil resistance to the chlorinated hydrocarbon insecticides is spreading to new areas. He said that a switch to other insecticides is in order.

County agents who have fields where resistance is suspected have been instructed by the Arkansas extension service to pick at least 1,000 squares from the plants in the fields, to let them dry for 2-3 days, and then to send them to the entomology research department, Agricultural Center, Louisiana State University, Baton Rouge.

Arkansas also reports increases in bollworm activity and aphid popula-

tions. Spider mites continue to be a serious pest, especially in northeast Arkansas.

H. T. Short, district extension agent at Jackson, Tenn., reports an increase in boll weevil activity and points out this could mean damage to late cotton. He urged farmers to keep a close check on damage and to stay in touch with county agents for advice on control programs.

The general crop outlook for the four states in the Mid-South was reported good. The first bale of cotton was harvested in the Mississippi Delta the second week in August, and other bales are beginning to roll to gins in the southern part of the state and in some of the hill sections. Soybeans and pastures continued good, and large quantities of hay are being harvested.

Arkansas farmers are beginning to look beyond this summer's crop by making a start on winter cover crops. Some farmers are preparing land for seeding of winter grains. The first open cotton of the season in southeast Missouri was reported in Pemiscot County. Crops in West Tennessee were reported as being badly in need of rain.

What's Been Happening?

This column, a review of news reported in *Croplife* in recent weeks, is designed to keep retail dealers on the regional circulation plan up to date on industry happenings.

The National Agricultural Chemicals Assn., through its executive secretary, Lea S. Hitchner, declared in a statement that the industry should not have to bear the cost of setting pesticide residue tolerances by the Food and Drug Administration, since the laws exist for the protection of the public and not for the benefit of pesticide manufacturers.

The Farm Bill, long-debated measure, was passed Aug. 18, awaiting the Presidential signature, considered certain. Despite wide predictions to the contrary, the bill did go through with only minor deviation from its version as passed by the Senate earlier.

The American Phytopathological Society met in Bloomington, Ind., to observe its 50th anniversary. Speakers told of possibilities for wider use of chemotherapeutants in the control of various plant diseases.

Spencer Chemical Co. announced a new line of non-pressure direct application solutions to its nitrogen products. Joe Tuning was named to coordinate the sales of anhydrous ammonia and solutions.

Fertilizer tonnages in California showed a considerable increase in the fiscal year 1957-58. Comparative total figures were 1,123,325 tons for 1957-58 as compared to 1,079,748 tons the previous fiscal year.

Yield estimates for the 1958 crop year were stepped up by the U.S. Department of Agriculture as of Aug. 1. Earlier estimates of crop production went by the board as a new look was taken. New records were set on some crops, and all were above average in volume.

The Canadian Agricultural Chemicals Assn. announced that Hon. Duff Roblin, Premier of Manitoba, will be a guest speaker on its program, along with representatives of manufacturing firms and others in the farm chemical field. The meeting was set for Sept. 15-17.

Conventioners at the 1958 Beltwide Cotton Mechanization Conference, Brownsville, Texas, were told that the use of herbicides and insecticides can enhance cotton growth and that such use brings added profits to growers by cutting unit costs of production.

That a "somewhat mixed" pattern of pesticide sales has existed throughout the 1958 season was observed by Melvin Goldberg, Pesticide Advisory Service, New York, in an article on Aug. 18. He said that price declines on some pesticides, exports, lack of demand for some products, and tight supply situations on others have made a confused picture.

Pesticide output for 1957 dipped some 10% below that of the previous year, according to a preliminary report by the U.S. Tariff commission. It said that production of pesticides and other organic agricultural chemicals amounted to some 512 million pounds.

Agronomists from all parts of the U.S. were in attendance at the annual meeting of the American Society of Agronomy at Purdue University, Lafayette, Ind., Aug. 4-8.

The Federal Food and Drug Administration said that it would raise the fee schedule for determination of pesticide residue levels as required under the terms of the Miller Amendment to the Food and Drug act.

The National Agricultural Chemicals Assn., Washington, D.C., announced that its annual fall meeting will be held at the Gen. Oglethorpe Hotel, Savannah, Ga. Oct. 29-31, instead of the Augusta, Ga. location as previously stated. The originally-set dates will remain the same, however.

Ketona Chemical Corp., Ketona, Ala., announced that it would expand its facilities for production of prilled ammonium nitrate and ammonium nitrate-limestone.

A. J. Schuler, president of the Welcome Agricultural Chemical Co., Welcome, Minn., died of a heart attack on Aug. 2.

The new farm bill, a victory for Ezra Taft Benson, secretary of agriculture, called for a new look at fertilizer and pesticide markets as a significant shift away from the parity concept loomed.

Charles M. Miller, former Monsanto Chemical Co. employee, was enjoined by the U.S. District Court in Salt Lake City from revealing any trade secrets and other information and data belonging to Monsanto. Now employed by Central Farmers Fertilizer Co., Mr. Miller had been accused of revealing trade secrets to his former employers.

A sum of \$280,000 a year was granted by Congress for a thorough study on the effect of pesticide spraying on wildlife.

Some 300 persons attended the Southwestern fertilizer grade hearing in Galveston, Texas in July.

The Midwest Regional Advisory Committee of the National Plant Food Institute approved plans for many-sided projects including grants-in-aid, scholarships, educational news services, and cooperation with bankers.

A public relations panel discussion and an imposing list of speakers are on the program for the 25th anniversary meeting of the National Agricultural Chemicals Assn. scheduled to be held at Savannah, Ga., Oct. 29-31. The association announced the tentative program plans late in July.

Paraguay exempted fertilizers from payment of import duties. Chemicals mentioned specifically in its law included commercial potash, caustic soda, sodium nitrate, sodium sulfate and sodium carbonate.

That food labels need carry no information about whether or not pesticides have been applied to the crop before harvest was decided by the House Interstate Commerce Committee. The ruling amended the definition of what constitutes chemical preservatives as referred to in the Federal Food, Drug and Cosmetic Act. Pesticides are not preservatives, it was brought out.

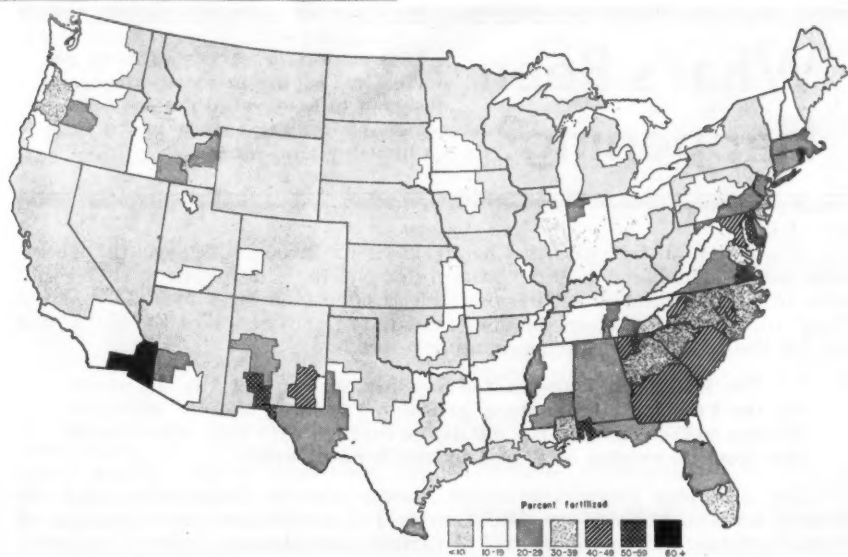


FIGURE 1—The percent of harvested acreage fertilized for hay and cropland pastures during 1954.

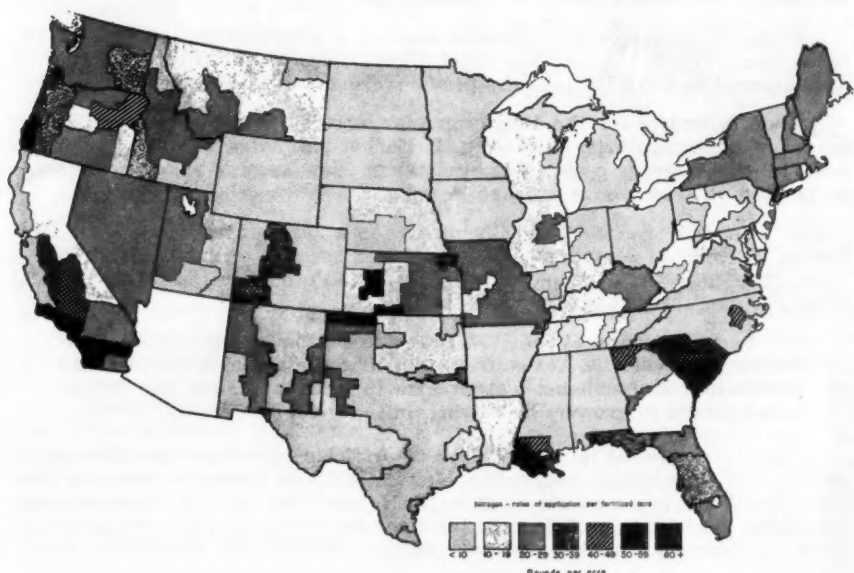


FIGURE 2—The estimated rates of N used per fertilized acre for hay and cropland pasture during 1954.

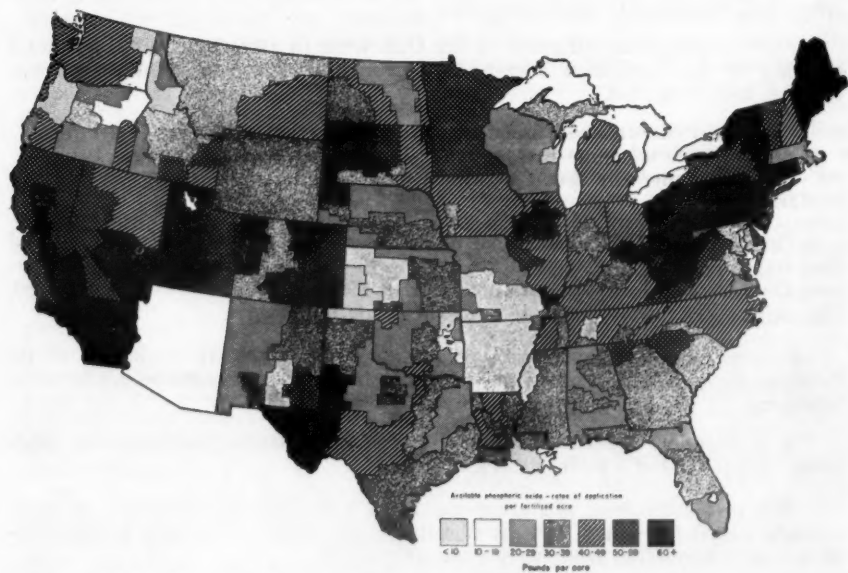


FIGURE 3—The estimated rates of available P₂O₅ used per fertilized acre for hay and cropland pasture during 1954.

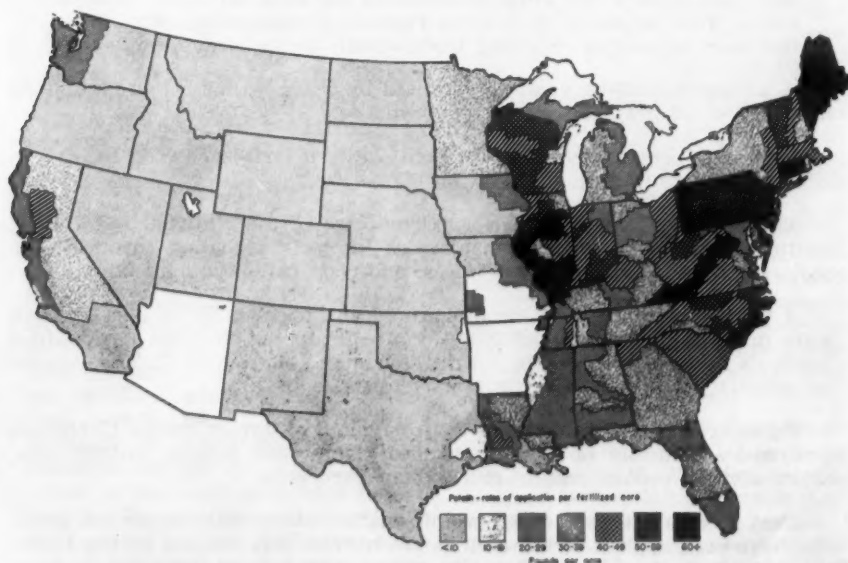


FIGURE 4—The estimated rates of K₂O used per fertilized acre for hay and cropland pasture during 1954.

TABLE 1—Hay and cropland pasture: Acreage harvested and percent fertilized, and estimated use of fertilizer and primary plant nutrients, by states, 1954.

| State | Total acres harvested ¹ | Harvested acres fertilized (2) | Fertilizer applied 2/ | Rate of application of nutrients per fertilized acre (2) | | |
|----------------|------------------------------------|--------------------------------|-----------------------|--|----------------------------|--------|
| | | | | Nitrogen | Available phosphoric oxide | Potash |
| | 1,000 acres | Percent | 1,000 tons | Pounds----- | | |
| Alabama | 2,160 | 27 | 141.4 | 0 | 31 | 31 |
| Arizona | 417 | 20 | 10.9 | 3/ 4 | 46 | 0 |
| Arkansas | 3,190 | 10 | 23.5 | 2 | 10 | 10 |
| California | 4,581 | 9 | 79.7 | 35 | 103 | 19 |
| Colorado | 2,317 | 3 | 8.1 | 7 | 81 | 0 |
| Connecticut | 328 | 23 | 23.0 | 23 | 90 | 97 |
| Delaware | 119 | 26 | 6.4 | 12 | 57 | 57 |
| Florida | 938 | 23 | 42.2 | 31 | 31 | 31 |
| Georgia | 1,806 | 39 | 132.1 | 16 | 40 | 32 |
| Idaho | 1,668 | 14 | 18.1 | 12 | 41 | 0 |
| Illinois | 4,992 | 8 | 138.9 | 13 | 58 | 71 |
| Indiana | 3,689 | 13 | 73.7 | 9 | 43 | 42 |
| Iowa | 6,962 | 7 | 53.6 | 2 | 41 | 7 |
| Kansas | 3,832 | 6 | 18.2 | 22 | 30 | 3 |
| Kentucky | 6,396 | 9 | 92.9 | 18 | 38 | 33 |
| Louisiana | 2,326 | 10 | 32.0 | 23 | 36 | 29 |
| Maine | 749 | 9 | 15.6 | 22 | 73 | 68 |
| Maryland | 811 | 42 | 46.7 | 10 | 40 | 30 |
| Massachusetts | 381 | 23 | 19.2 | 26 | 25 | 48 |
| Michigan | 4,229 | 8 | 42.8 | 6 | 44 | 30 |
| Minnesota | 5,384 | 7 | 42.4 | 0 | 57 | 32 |
| Mississippi | 2,120 | 19 | 58.6 | 2 | 27 | 22 |
| Missouri | 6,939 | 8 | 67.1 | 22 | 20 | 15 |
| Montana | 3,018 | 4 | 7.5 | 17 | 38 | < 1 |
| Nebraska | 6,541 | 3 | 15.9 | 14 | 29 | 2 |
| Nevada | 574 | 2 | 1.4 | 26 | 56 | 5 |
| New Hampshire | 304 | 15 | 8.8 | 22 | 43 | 39 |
| New Jersey | 411 | 27 | 33.0 | 14 | 42 | 42 |
| New Mexico | 660 | 13 | 6.9 | 23 | 45 | < 1 |
| New York | 4,513 | 6 | 57.1 | 24 | 60 | 36 |
| North Carolina | 1,560 | 33 | --- | 6 | 45 | 46 |
| North Dakota | 4,304 | 1 | 1.6 | 0 | 38 | 0 |
| Ohio | 4,246 | 10 | 76.2 | 4 | 56 | 32 |
| Oklahoma | 3,754 | 8 | 30.2 | 12 | 24 | 4 |
| Oregon | 2,011 | 3/ 16 | 27.5 | 32 | 15 | 1 |
| Pennsylvania | 3,124 | 12 | 67.1 | 9 | 64 | 64 |
| Rhode Island | 42 | 71 | 5.5 | 15 | 37 | 37 |
| South Carolina | 1,102 | 38 | 83.5 | 53 | 42 | 45 |
| South Dakota | 5,922 | 1 | 5.0 | 3 | 47 | < 1 |
| Tennessee | 4,364 | 15 | 98.1 | 10 | 38 | 30 |
| Texas | 8,882 | 9 | 99.6 | 6 | 34 | 4 |
| Utah | 827 | 7 | 7.0 | 18 | 61 | 0 |
| Vermont | 911 | 14 | 21.5 | 8 | 58 | 53 |
| Virginia | 2,276 | 22 | 151.4 | 4 | 45 | 54 |
| Washington | 1,546 | 13 | 24.6 | 26 | 39 | 12 |
| West Virginia | 1,224 | 8 | 19.4 | 12 | 60 | 48 |
| Wisconsin | 6,113 | 4 | 32.4 | 12 | 24 | 48 |
| Wyoming | 1,381 | 4 | --- | 3 | 34 | < 1 |

¹Preliminary figures (3).

²Estimates based on data from Soil and Water Conservation Research Division, U.S. Department of Agriculture.

³Revised.

FERTILIZER USE

(Continued from page 1)

gia with 39%, South Carolina with 38%, and North Carolina with 33%. On the other extreme, many parts of the Great Plains have less than 1% of their harvested pasture acreage fertilized.

Rates of N application per fertilized acre vary considerably, possibly depending upon the extent that grass hays and pastures are grown. Generally, highest N rates are used in the Pacific Coast States, New England (except Vermont and Rhode Island), New York, Missouri, Kansas, eastern Kentucky, South Carolina, Florida, southeastern Louisiana, and irrigated areas of the Mountain and Plains States.

Phosphate, in sharp contrast to N and K₂O, is applied at relatively high rates on the fertilized pastures over much of the country. California reports an average use of 104 lb. P₂O₅ per fertilized acre. Other high-application states are Connecticut with 90; Colorado, 81; Maine, 74; Pennsylvania, 64; Utah, 61; and New York and West Virginia, 60 lb. Lowest was Arkansas with 10 and Oregon with 15 lb. per fertilized acre.

Sharp differences in rates of P₂O₅ application reflect differences in soils between adjacent areas in some instances. Outstanding examples of low-rate areas near areas of more intensive use are the alluvial soils of Mississippi, the phosphatic-limestone soils of central Tennessee, the Blue-grass soils of Kentucky, the Marshall soil in western Iowa, the Kewaunee-Oshkosh-Poygan soils of eastern Wisconsin, and the Miami-Crosby-Brookston soils of central Indiana.

Higher rate areas such as the Piedmont soils in South Carolina, the Mountain soils in Georgia, the Black-belt, Appalachian Valley, and Pied-

mont soils in Alabama, the Middle and Upper Coastal Plain soils in Louisiana, and the Appalachian Highland soils in eastern Ohio are near areas of less intensive use.

Marked changes in P₂O₅ applications per fertilized acre frequently occur when state lines cross a soil area. For example, rates on the Coastal Plain soils are different on either side of the state line separating North Carolina and South Carolina and the state lines separating Louisiana, Arkansas, and Texas. Similarly, rates used on the Piedmont soils are not the same on both sides of the state lines of South Carolina and Georgia, and the rates on the Fayette soils are different on either side of the state lines of Minnesota, Wisconsin, and Iowa.

Potash rates per fertilized acre of hay and cropland pasture are highest in the eastern states, in Washington west of the Cascades, and in California. Highest rates by states are Connecticut, 97 lb.; New Jersey, 74; Illinois, 71; Maine, 68; Pennsylvania, 64; Delaware, 57; Virginia, 54; and Vermont, 53. Potash application is negligible throughout the Great Plains and Mountain States because of the high level of available potassium in the soils.

Numerous instances also exist in which K₂O rate patterns coincide with soil areas. Potash rates coincide with the same soil areas as do P₂O₅ rates in Louisiana, Mississippi, Alabama, Georgia, and Florida. Close relationships between soils and K₂O rates exist in a number of other states, Ohio particularly. Soils of the Appalachian Highland in eastern Ohio receive the highest rates followed in turn by the east-central till-plain soils and the lakebed soils of the northern and the

claypan soils of southern parts of the state.

Inconsistencies exist in some states in the potash use pattern. In North Carolina, K_2O rates are highest in the Coastal Plain area and lowest in the Piedmont and Mountain areas. In Virginia, this relationship is reversed, while South Carolina and Maryland show no distinction between the areas.

In the 31 eastern states, 26 approach a 1:1 $P_2O_5:K_2O$ ratio, Massachusetts and Wisconsin approximate a 1:2 ratio and New York, Ohio, and Minnesota, a 2:1 ratio.

References

- (1) Adams, J. R., Nelson, L. B., and Ibach, D. B.
1958. Crop-Use Patterns of Fertilizer in the United States. 1954. II. All Crops and Cropland Pasture. Croplife 5 (In press).
- (2) Ibach, D. B., Adams, J. R., and Markeson, C. B.
1957. Fertilizer Used on Crops and Pasture in the United States. 1954 Estimates. U.S. Dept. Agr., Statis. Bul. 216, 55 pp., illus.
- (3) United States Bureau of the Census.
1955. Census of Agriculture: 1954.

ACREAGES

(Continued from page 1)

vides the usual additional 310 thousand acres of land for small—less than 10 acres cotton—farms which have a minimum acreage limit.

In many respects the bill is more liberal for the 1959 cotton crop than previous measures offered to Congress. For example, under this bill a small cotton farm of 12 acres will receive an allotment of approximately 10 acres in 1959. The 4 acre farm operator will obtain the same acreage he had in 1958.

Fragmentary opinions obtained here from USDA and private trade circles indicate that Texas cotton farmers alone, under the lower level of price support of 65% of parity with a 40% increase in acreage, may expand production by at least one million acres.

California may be expected to increase acreage by 300-400,000 acres. A similar increase of the latter may be anticipated from Missouri, Arkansas, Mississippi and the Delta area. This would amount to an overall increase which would fix the cotton crop acreage for 1959 at about 18 plus million acres.

It has been generally contemplated that there will be a decline in cotton production on the small cotton farms—those of ten acres or less. USDA officials are inclined to discount this generalization stating that on many small farms where family operations have children available for labor with some machinery, that these small farms may take the choice of lower levels of support and expand production since they can grow 14 acres of cotton as well as ten.

Many of the small cotton farmers may not have access to financing under lower levels of support and consequently they may not be able to take advantage of expanded production.

USDA officials point out that many of those relatively small farms are owned by absentee landlords who have mutual interests in gins, banks, cottonseed operations and the sale of seed which ultimately will work out profitably under expanded production of cotton even at lower levels of price support. The farmer—the tenant—will be the loser.

If that estimate is an important factor in the decision among the cotton farmers to choose between plan (A) of the farm bill which provides 80% of parity support in 1959 on the

basis of approximately 16.6 million acres or plan (B) which provides not less than 65% of parity for cotton farmers who may exceed their proportionate acreage allotment by 40%, would indicate that the 18 plus million acre cotton crop for 1959 may not be extravagant.

USDA working level officials now estimate that even after cotton farmers may have voted in the early December referendum—it is actually a referendum to decide if the farmers want acreage allotments and marketing quotas—they will still have until mid-January, 1959, to determine which alternative they will use in planting their cotton crop.

In view of these vagaries of the cotton situation it is still believed at USDA that cotton acreage will amount to better than 18 million acres in 1959. It could be higher.

From that vague viewpoint there is not much meat for the fertilizer industry in planning its forward sales.

Corn More Definite

In the case of corn the issue is clearer.

The USDA workshop now sees a total corn acreage of about 77.5 million—an increase of about 4 million over last year spread over the nation. This estimate takes into consideration the acreage reserve commitment of this year which took out about the same amount of corn land which would probably not have been planted to corn. And this estimate takes into consideration the commitment of what otherwise would have been corn land in the conservation reserve program.

At the same time, top USDA officials, aware of this workshop estimate for 1959 corn acreage, declare that total feed grain acreage will not exceed that of this current year. This comment is based on the lower levels of price support which probably will be available for the minor feed grains—oats, barley, rye and grain sorghums.

It also must be expected that USDA will lower the levels of support for soybeans next year to reflect a proper relationship for that crop with the probably reduced levels of support for corn.

In the case of corn under the new farm bill, that crop will be subject to a referendum between the choices of the present farm program with price supports at between 75-90% of parity with acreage allotments which would under those conditions decline by about 10% from last year or about 10% in the commercial corn belt or as an alternative accept the higher of 65% of parity or 90% of the immediately preceding three years' national market price without acreage allotments.

The farm arithmetic in regard to this choice works out about this way:

A corn farmer who might vote to retain acreage allotments would obtain—if acreage allotments were approved—a level of support of approximately \$1.32 bu., while the non-cooperator would obtain no level of support except by administrative action at USDA. In the old non-commercial Corn Belt under an approval of acreage allotment, those corn producers would obtain 75% of the parity level of support for the commercial corn area.

This would mean that for the non-commercial corn areas the level of price support for 1959 would be slightly less than \$1.

However, under the terms of the farm bill, the alternate choice of no acreage allotments for corn would provide an over-all level of price support for corn of about \$1.15 bu.

Using only kitchen table arithmetic, it must be apparent that the corn acreage allotment referendum will be defeated this fall and that all

corn farmers will accept a price support level of not less than \$1.14 bu.

This will mean in the case of commercial corn acreage a reduction of about 20¢ bu. This corn production was relatively a minor part of production from the old Corn Belt in this crop year. However, the proposed new level of price support for all corn will be substantially higher—\$1.14 as against \$1.10 which has prevailed for the past year for non-compliers in the commercial Corn Belt.

The application of the new farm bill remains a cloudy mystery except insofar as judgments here and from the trade may find an escape from this maze. All signs lead to the conclusion that the corn farmers will nationally reject acreage allotments next year and if that happens, according to USDA workshop folks, it will mean a corn acreage of about 77.5 million nationally.

★ ★ ★

Bankers' Attitudes May Change With New, Lower Support Prices in View

WASHINGTON—An economic factor possibly concealed from general view is that as price support levels for commodities are reduced, it will freeze the attitude of local or commercial bankers to lend money for the expansion of farm production. This attitude would affect advances of funds for capital investment such as new farm equipment, fertilizer and facilities.

It has been the supposition in many quarters that if the levels of price support were to be reduced, that farmers would merely expand acreage to grow larger crops to make up in unit production the loss in levels of price support.

One substantial USDA official told Croplife this past week that this condition may not occur. The new farm bill with its lower levels of support for cotton, corn and rice may not affect this observation next year, but this official suspects that it will materially slow down banker initiative to grant credits for capital investment to a point where the potential acreage expansion must be modified.

Lower loan levels—a protection point to local bankers on loans—will be a stop-point where the local banker will gladly give his okay for commitments.

This is one of the most significant items this reporter has ever sent out. It observes some deep consideration. No matter how much acreage allotments may be increased by Congress under expanded allotments for corn, cotton or rice, the man who sits behind the desk at the local bank is going to take a long look at the new farm bill and make his decisions therefrom.

In short, all decisions should not be based on the broad aspects of the farm bill. The local banker should be contacted for his opinion.

Thomas F. Cook Named to New IMC Position

CHICAGO—International Minerals & Chemical Corp. has named Thomas F. Cook as district sales manager of its plant food division, with headquarters in Tupelo, Miss.

In his new position, Mr. Cook will be in charge of a territory that includes Mississippi and western Tennessee.

Joining International in 1952 as a sales representative, Mr. Cook was promoted to district manager at Montgomery, Ala., in 1956. He is a graduate of Oklahoma A&M in agriculture, and was in the U.S. army from 1943 to 1946. He was a plant food sales representative for Swift & Co. in northern Mississippi for six years before coming to IMC.

MERCHANDISING

(Continued from page 15)

is cooperating will not have to waste too much time and effort. In addition, we find that these club members like to look at merchandise and frequently buy lots of stuff before they leave.

FERTILIZER SALES: Here you need a circus atmosphere, and we found that great big placards out on the street about a fertilizer sale, tremendous quantities of from 40 to 200 bags of each particular brand of fertilizer stacked on the porch, and a booth from which sales are made have been most effective. In addition, this is an item that is bought widely and you have to have a realistic price. Don't worry about the merchants who sell fertilizer cheaper than you do if they don't advertise it. Just concern yourself with the prices of fertilizers that are advertised.

GRASS CLINICS: Here's a promotion to illustrate one of the points previously made. We think that the only way to put on a grass clinic and have it strictly first class in our area is to have the assistance of an expert in grasses. We wanted a grass clinic last year and we wanted a grass clinic this year, and we were not able to get an expert for either one of these clinics. Therefore, we haven't had one. This all goes back to the point previously discussed... on the first event you have just got to go first class or you had better stay home!

WILD BIRD FEEDS: Here is another interesting promotion that we have carried on over the years in a small way.

We have at our garden center a wild bird food cafeteria, which is a 5-ft. feeder that has 22 divisions in it. Here we test ingredients to find their palatability. We show this to people that are interested in feeding wild birds. In times of extremely bad weather, such as we have had this past winter, and when we have snow and ice, we use the radio and urge people to feed wild birds while they are cut off from their usual sources of food. We keep up feeders and houses and have attracted enough birds in this area around the garden center that it is visited by Boy Scouts and Bird Watchers—the Boy Scouts working on bird watching merit badges—and all of this brings on much talk.

BEAN MOSAIC

(Continued from page 1)

ping practices, by development of plants resistant to viruses, or by control of insects that transmit virus diseases.

Virus diseases in plants are world-wide. Such diseases affect many important food and fiber crops produced in the U.S. and frequently cause heavy losses to farmers.

The work done by the two virologists at USDA's Agricultural Research Center, Beltsville, Md., gave the first evidence of southern bean-mosaic virus transport from non-living plant cells into uninjured living cells.

In this experiment, the scientists killed stem sections of bean plants with steam and introduced the virus into water-conducting cells of the plants below the killed areas. Later they found virus disease symptoms and virus multiplication in living cells well above the killed areas.

TO STUDY IRRIGATION

MANHATTAN, KANSAS—A study of the effect of irrigation water on soil properties has recently been started at Manhattan, according to Hyde S. Jacobs, agronomist at Kansas State College.

Croplife

A WEEKLY NEWSPAPER FOR THE FARM CHEMICAL INDUSTRY

The regional circulation of this issue is concentrated in the Northeastern states.

Economic Information on Tree Fertilization Sought

BRINGING together scattered data on forest fertilization may be of considerable moment to the plant food industry in years to come. At least that is the thinking of the National Plant Food Institute as it seeks to determine the nature and extent of forest fertilization studies presently under way, to sum up what is known and to avoid further duplication of effort.

The Institute has appointed Dr. Laurence C. Walker of the University of Georgia to act as chief forester and to explore the need for a coordinated program of research activities in the field.

Once such a study has been made, the next step will be to devise a plan of research under which the efforts of those now studying forest fertilization might be coordinated for maximum effectiveness. Groups currently in the process of looking over the economics of forest fertilization include the land-grant colleges, a number of pulp and paper companies, and fertilizer firms. Getting all of these separate efforts organized would be a big job, but one well worth doing.

The Institute, in commenting on the project, says that studies will be set up to determine the economic feasibility of fertilizing forest trees of various species under different soil conditions. Support for these studies will be initially, at least, from National Plant Food Institute grants and will be designed to provide results estimating the economic feasibility of fertilizing trees for pulp and lumber purposes.

A considerable interest has been shown in recent years toward forest fertilization. Notable strides have been made in this field by several commercial fertilizer companies working independently of each other, but active interest has also been shown by many of the major paper and pulpwood companies.

Yet, despite the admirable amount of work that has been done and is still being conducted, there seems to be but little precise information available on the economics of forest fertilization. In the end, it is this matter that will determine whether forest fertilization is to be adopted on a wide scale.

The appointment of Dr. Walker to coordinate this program appears to be a step in the right direction. The industry stands to gain a great deal should there be a marked shift toward applying fertilizers to those thousands of acres of valuable timberland not now fertilized at all.

Good Year Looms Ahead

ENCOURAGING signs appear in many spots on the horizon so far as the future for chemical products used in agriculture is concerned. Increased acreages expected to be used in 1959 will require additional amounts of fertilizers and pesticides.

The pesticide trade, having experienced a fairly good year, can look forward to another one, providing of course that the factors of weather and abundance of agricultural pests are favorable. With these variables in the offing, plus the usual considerations of price and distribution problems, it is difficult to predict with much accuracy the way the insecticidal ball will bounce come 1959.

The fertilizer trade sold materials up to about 75% of the industry's productive capacity this year. Next year shows promise of bigger things, with a number of helpful factors apparently ready to exert their influence.

Among these are the benefits from educational programs conducted to show farmers the favor-

able economics involved in fertilizer use; the trend toward increasing use of plant food in commercial forestry; and the indicated growing need for fertilizer along the superhighways planned for construction in the next few years.

The pesticide and fertilizer industries are operating on more firm ground each year, as the need for these products becomes better known and as proof of the favorable economic picture comes into focus.

More "Viewing with Alarm" By Newspaper Writers

DESPITE court decisions and recent moves by the U.S. government toward finding whether or not hazards actually exist in broad-scale spraying projects, the clamor about them seems to persist. Not only on Long Island where some residents challenged the right of anyone to "douse" them with pesticidal sprays in an effort to rid the area of gypsy moth, but a Boston newspaper has also joined in the chorus.

"One of the growing businesses today is spreading poison," the Boston Herald said in its issue of Aug. 25. This job is done by "big spraying and dusting machines spewing forth great clouds drifting with the winds. No one knows if the many millions of pounds of poisons cast upon the land are doing more harm than good. And no regulations, beyond those restricting spray residues in food, control this mass poisoning," the paper continued.

"... We do not have the slightest knowledge of whether these poisons are building up year after year in the soil, in our wildlife, in our domestic animals and in ourselves, to present us sometime with a catastrophe we did not foresee."

It seems to us that the Herald is biting off a sizable bit of assumption in alluding to this spraying work as being done with no calculation of possible dangers. Department of Agriculture scientists and representatives of the Fish and Wildlife division of the Department of the Interior did a lot of "calculating" before any of the spray programs were launched.

It might also be news to the Herald that Congress recently granted a sum of \$280,000 a year to study the effect of spraying on fish and wildlife. This program will answer many questions once and for all, and should satisfy everyone concerned that these spraying projects are not operated in a wild and reckless manner, oblivious to all possible hazards to crops, livestock, wildlife, and human beings.

The Herald article does not bear the mark of a "crank editorial" since it shows an understandable concern about what these spray programs might be doing in the way of long-term harm. But despite the obvious good intentions of writings of this type, the readers are likely to be considerably shaken at the prospects of "catastrophe" and the connotations derived from phrases such as "the mass spreading of poison" are anything but pleasant.

The pesticide trade, faced with this problem for years, has made good headway in its public relations program, but there is obviously a lot of ground to cover yet before a full understanding on the part of the fearful public is achieved.

Discussions on the public relations aspect of the pesticide trade will be prominent on the program of the National Agricultural Chemicals Assn. in its 25th anniversary meeting at Savannah, Ga., next month. Every pesticide formulator in the country has a potential public relations problem on the local level, and we hope that a high percentage of these manufacturers will be on hand at the Savannah meeting to help talk over the situation.



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CROPLIFE is a controlled circulation journal published weekly. Weekly distribution of each issue is made to the fertilizer manufacturers, pesticide formulators and basic chemical manufacturers. In addition, the dealer-distributor-farm adviser segment of the agricultural chemical industry is covered on a regional (crop-area) basis with a mailing schedule which covers consecutively, one each week, four geographic regions (Northeast, South, Midwest and West) of the U.S. with one of four regional dealer issues. To those not eligible for this controlled distribution Croplife subscription rate is \$5 for one year (\$8 a year outside the U.S.). Single copy price, 25¢.

LAWRENCE A. LONG

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MEETING MEMOS

Oct. 1—Field Day, Eastern Virginia Research Station, Warsaw, Va.

Meeting Memos listed above are being listed in this department this week for the first time.

Sept. 4—Grassland Field Day, Rutgers University Dairy Research Farm, Beemerville, N.J.

Sept. 4-5—Forest Fertilization School, University of Washington, Pack, Wash.

Sept. 10—Agronomy Fall Field Day, Lincoln, Neb.

Sept. 10-11—Midwest Regional Accident Prevention School for Supervisory Personnel of the Fertilizer Industry, National Safety Council Headquarters, Chicago.

Sept. 11—Field Day, Northern Virginia Pasture Research Station, Middleburg, Va.

Sept. 11—Agronomy Farm Field Day, Purdue University Agronomy Farm, Lafayette, Ind.

Sept. 12—Agronomy Field Day, University of California, Davis, Cal.

Sept. 15-17—Canadian Agricultural Chemicals Assn., Sixth Annual Meeting, Fort Garry Hotel, Winnipeg, Manitoba.

Sept. 16-17—Farm Advisers Fertilizer Technology School, University of California, Berkeley. Headquarters: Giannini Hall.

Sept. 24—New England Fertilizer Conference, Bald Peak Colony Club, Melvin Village, N.H.

Sept. 25—Chemical Industry Safety Workshop; Shamrock Hilton Hotel, Houston, Texas.

Oct. 13—Agricultural Research Institute Panel on Problems Related to Agriculture in the Fertilizer Producing Industry, Academy of Science Bldg., Washington, D.C.

Oct. 14-15—Western Agricultural Chemicals Assn., Annual Meeting, Villa Hotel, San Mateo, Cal., C. O. Barnard, 2406 Kenwood Ave., San Jose 28, Cal., Executive Secretary.

Oct. 16—National Plant Food Institute Conference on Chemical Control Problems; Shoreham Hotel, Washington, D.C.

Oct. 17—Association of American Fertilizer Control Officials, 12th Annual Meeting, Shoreham Hotel, Washington, D.C., B. D. Cloaninger, Box 392, Clemson, S.C., Secretary-Treasurer.

Oct. 20—Annual Sales Clinic of Salesmen's Assn. of the American Chemical Industry, Inc., Roosevelt Hotel, New York.

Oct. 20-21—Fertilizer Section, National Safety Council, annual fall meeting, La Salle Hotel, Chicago, Ill.

Oct. 22-24—Pacific Northwest Plant

Food Assn., Annual Meeting, Gearhart, Ore., Leon S. Jackson, P.O. Box 4623, Sellwood-Moreland Station, Portland, Ore., secretary.

Sept. 25—New Jersey Fertilizer Conference, Rutgers University, New Brunswick, N.J.

Oct. 28-29—Northwest Garden Supply Trade Show, Masonic Temple, Portland, Ore.

Oct. 29-31—National Agricultural Chemicals Assn., 25th annual meeting, General Oglethorpe Hotel, Savannah, Ga.

Oct. 30—Annual Southeastern Soil Fertility Conference, Atlanta Biltmore Hotel, Atlanta, Ga.

Nov. 5-7—Fertilizer Industry Round Table, Mayflower Hotel, Washington, D.C.

Nov. 9-11—California Fertilizer Assn., 35th Annual Convention, Ambassador Hotel, Los Angeles, Sidney H. Bierly, 475 Huntington Drive, San Marino 9, Cal., General Manager.

Nov. 10-11—Agricultural Aviation Research Conference, Milwaukee.

Nov. 18-20—Washington State Weed Conference, Moses Lake, Wash.

Nov. 19-20—Carolinas-Virginia Pesticide Formulators' Assn., Carolina Hotel, Pinehurst, N.C.

Nov. 16-18—National Fertilizer Solutions Assn., Netherland Hilton Hotel, Cincinnati, M. F. Collie, 2217 Tribune Tower, Chicago, Executive Secretary.

Nov. 24-25—Entomological Society of America, Eastern Branch, Annual Meeting, Lord Baltimore Hotel, Baltimore.

Dec. 1-4—Entomological Society of America, Annual Meeting, Hotel Utah, Salt Lake City.

Dec. 3-4—North Central Weed Control Conference, Netherland Hilton Hotel, Cincinnati.

Dec. 3-4—Annual Soil Fertility and Plant Nutrition Short Course, University of Missouri, College of Agriculture, Columbia, Mo.

Dec. 3-5—Agricultural Ammonia Institute, Annual Meeting, Morrison Hotel, Chicago, Jack F. Criswell, Claridge Hotel, Memphis, Executive Vice President.

Dec. 8—Annual Soils and Fertilizer Short Course, Coffey Hall, University of Minnesota Institute of Agriculture, St. Paul.

Dec. 9-11—Chemical Specialties Manufacturers Assn., Annual Meeting, Commodore Hotel, New York.

Dec. 17-18—Beltwide Cotton Production Conference, Rice Hotel, Houston, Texas, sponsored by the National Cotton Council.

Jan. 20-22, 1959—California Weed Conference, Santa Barbara, Cal.

July 7-9—Pacific Northwest Plant Food Assn., 10th Annual Regional Fertilizer Conference, Tacoma, Wash.

Modern Liquid Fertilizer Plant Planned in Kentucky

CEDAR RAPIDS, IOWA — The Barnard & Leas Manufacturing Co. of Cedar Rapids has announced conclusion of plans for the complete installation of facilities for a liquid fertilizer plant at Morganfield, Ky.

This new plant will be erected by Land O'Nan Warehouse of Sturgis, Ky., and will include completely modern equipment throughout, including Barnard & Leas' new "Autobatch Skid Unit." The expanded facilities are expected to be ready for operation by Oct. 1, 1958, according to a spokesman for the company.

The new plant will provide plant food grades of the type recommended in its marketing area, the announcement indicated.

Soils and Fertilizer Workshops Planned

ST. PAUL, MINN.—Soils and fertilizer workshops have been scheduled at three Minnesota experiment stations for September 3, 4 and 5, according to Curtis J. Overdahl, extension specialist in soils at the University of Minnesota.

The sessions, each scheduled for 1 p.m., will be held at Waseca on Sept. 3; Morris, Sept. 4; and Crookston, Sept. 5.

The program will be geared primarily toward fertilizer dealers, Mr. Overdahl says. Speakers will include Dr. A. C. Caldwell and Dr. J. M. MacGregor of the soils department, who will conduct informal sessions.

Tours of the fertility plots at each of the stations are planned.

Weed Group Meets

SACRAMENTO, CAL. — The California State Chamber of Commerce Weed Committee will meet in San Francisco Sept. 30 to discuss the state's \$300,000,000 weed problem

Classified Ads

Classified advertisements accepted until Tuesday each week for the issue of the following Monday.

Rates: 15¢ per word; minimum charge \$2.25. Situations wanted, 10¢ a word; \$1.50 minimum. Count six words of signature, whether for direct reply or keyed care this office. If advertisement is keyed, care of this office, 20¢ per insertion additional charged for forwarding replies. Commercial advertising not accepted in classified advertising department. Display advertising accepted for insertion at minimum rate of \$11 per column inch.

All Want Ads cash with order.

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FACTORY SUPERINTENDENT WANTED for northeastern mixing plant—no acidulating. Write stating experience, references. Address Ad No. 4041, Croplife, Minneapolis 40, Minn.

SITUATIONS WANTED

AS PLANT MANAGER OR ASSISTANT thoroughly familiar with all phases of plant management, purchasing, budgeting, sales cost and plant accounting. Address Ad No. 4046, Croplife, Minneapolis 40, Minn.

MISCELLANEOUS

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KILL BRUSH at low cost with amazing R-H Brush Rhap. Will not injure grasses, grains, cattle, or other animals. See your dealer, or write Reasor-Hill Corporation, Box 36CL, Jacksonville, Ark.

and how to solve it, according to J. Earl Coke, chairman.

The committee is seeking community or area programs aimed at weed control. "For only one person in a community to control weeds while his neighbors let theirs go is of little value," Mr. Coke observed.

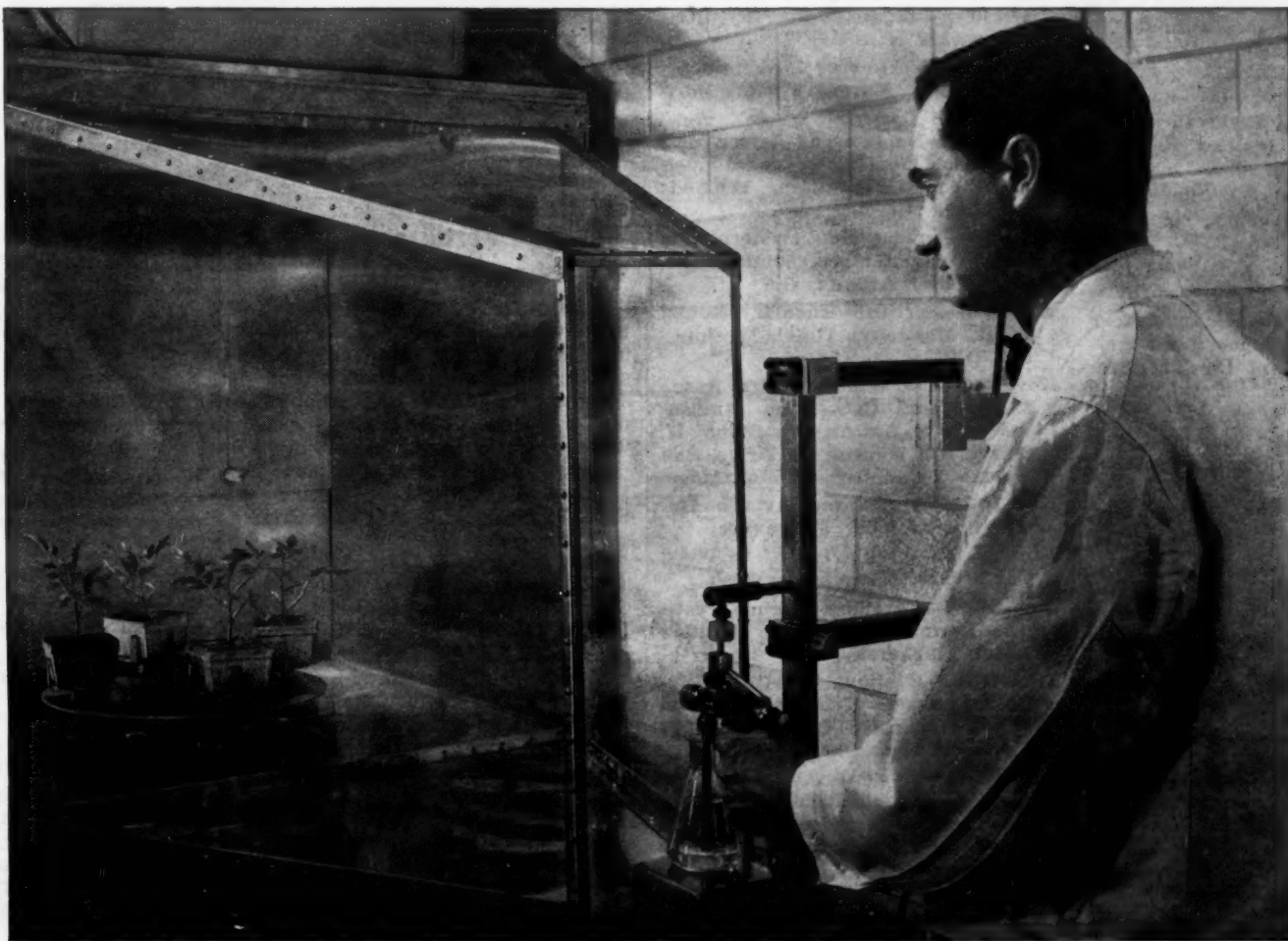
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HERCULES RESEARCH— First Step Toward Improved Pesticides

From the Hercules Research Center and Agricultural Chemicals Laboratories come an ever increasing number of products that contribute to more productive farming and increased comfort for leisure hours. Here are the established members of the Hercules family: *Toxaphene* agricultural insecticide; *Thanite*® for oil base and aerosol insecticides; *Delnav** phosphate pesticide; *meta Delphene*® insect repellent; *Delrad*® algicide.

Today in the laboratories research continues on the products that will join them in the future. But before they become available you can be sure that thousands of compounds have been carefully screened and extensive tests conducted in the field because only the best is good enough to meet the standards of Hercules research. That's why you can look to Hercules for leadership in the development of insecticides, fungicides, and herbicides.



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